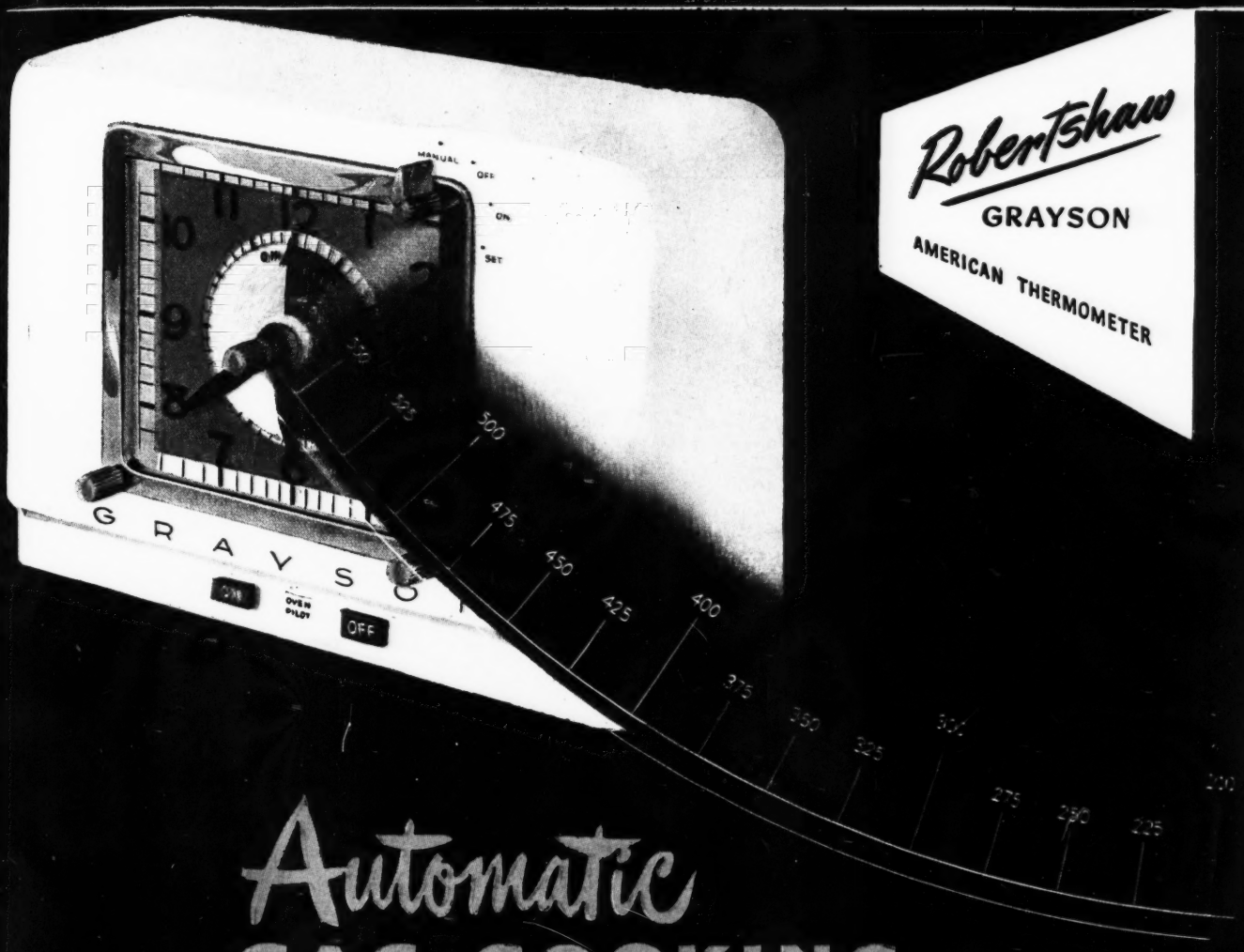
GAS

ENGINEERING • UTILIZATION • LOAD-BUILDING • MANAGEMENT



Robertshaw
GRAYSON
AMERICAN THERMOMETER

Automatic GAS COOKING

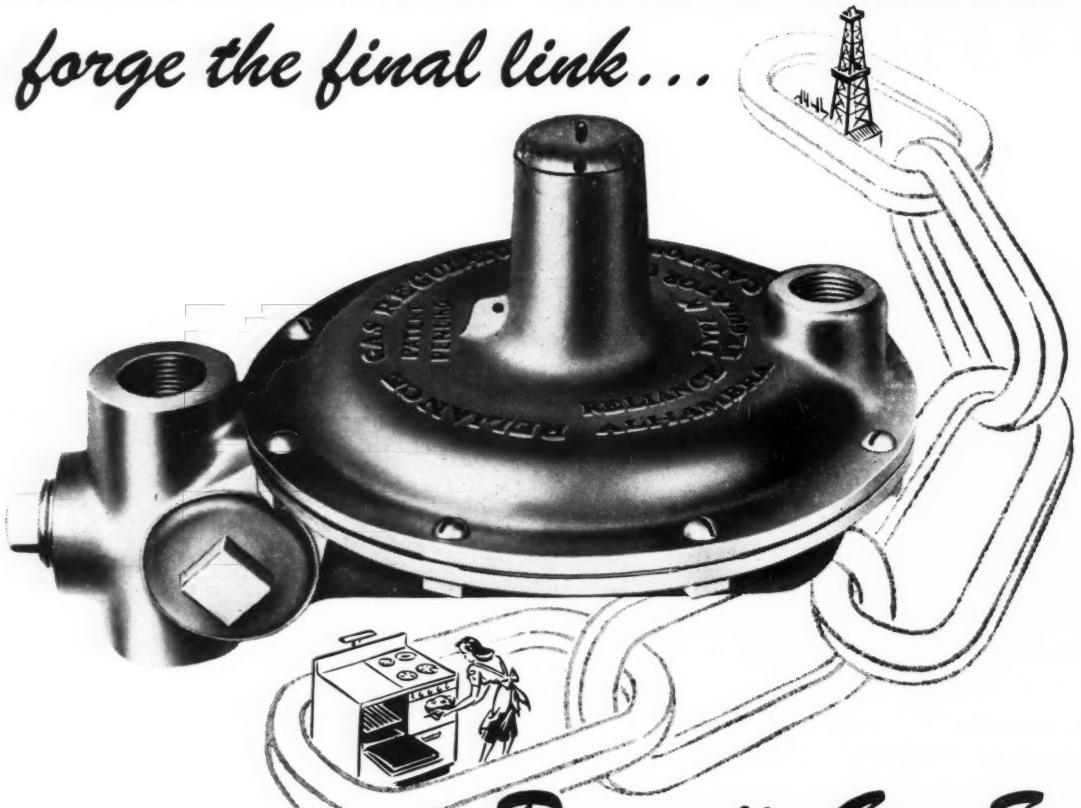
Together, ROBERTSHAW heat control and GRAYSON time control, perfectly synchronized and precision engineered, make possible the automatic gas range, a milestone for the entire gas industry.

And to meet the ever-increasing demand for this wonder range, automatic oven valves and safety pilots are now being manufactured in both Youngwood and Lynwood plants. A single national sales organization serves your control needs.

ROBERTSHAW THERMOSTAT COMPANY, YOUNGWOOD, PENNA.
GRAYSON CONTROLS DIVISION, LYNWOOD, CALIFORNIA
AMERICAN THERMOMETER DIVISION, ST. LOUIS, MISSOURI

RELIANCE REGULATORS

forge the final link...



...in Domestic Gas Service

GAS has quite a history from oil field to oven. It's the story of well drilling and gas testing. It's the romance of a molecule of CH_4 from the compressors, out through the lines to the meter and the regulator. Gas follows all the links in this chain. But it has a single purpose, the supplying of peak heat under rigid regulation.

With regulation comes customer satisfaction – the achievement of oven excellence, low cost operation, and minimum servicing. The home regulator is your perpetual retail gas salesman. It is the last telling contact of company with customer. Only through proper home regulation can the many controls of the gas industry be kept satisfactorily at work in the consumers' homes.

Realizing its role as a vital link in the gas chain, Reliance has made reliable home regulators. The Reliance type K and H regulators have high capacity because the toggle joint action allows the valve plunger to move directly away from the valve orifice. The toggle joint cannot go beyond center because of the stop in the upper diaphragm chamber. Complete lockup occurs when no flow exists, due to this powerful toggle action.

Different size valve orifices are easily interchanged by removing the end pipe plug and inserting a hexagon wrench into the recess provided in the valve body.

Valve seat discs are easily accessible through the inspection plug in the side of the Regulator. Valve discs come in either leather or composition material; the leather diaphragms being bark tanned or semi-chrome, specially treated for long service, flexibility and tightness. Composition diaphragms can also be provided where required.

Varying inlet and outlet sizes are available ranging from ¾" to 2". These regulators will control inlet pressures up to 75 pounds and outlet pressures up to 22 inches water column with the proper spring, and can also be equipped with automatic shut-offs and safety relief valves in all sizes when required.

These are some of the reasons why Reliance Regulators have stood the test of time and have given years of continuing satisfactory service.

Write for Bulletins 38 and 41.

AMERICAN METERS

RELIANCE REGULATORS

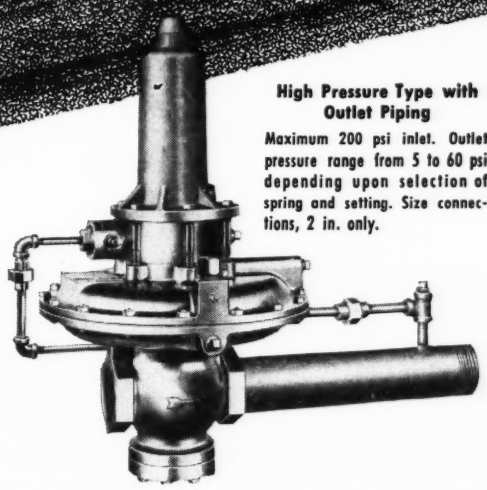
A GENERAL PURPOSE
REGULATOR
WITH *ALL* THESE OUTSTANDING ADVANTAGES

Standard Type with Outlet Piping

Maximum 200 psi inlet. Outlet pressure range from 2 oz. to 20 psi depending upon selection of spring and setting. Size connections, 2 in. only.

High Pressure Type with Outlet Piping

Maximum 200 psi inlet. Outlet pressure range from 5 to 60 psi depending upon selection of spring and setting. Size connections, 2 in. only.



PILOT LOADED DIAPHRAGM
Assures movement of the operating diaphragm with the slightest change in controlled pressure to provide the finest degree of control accuracy.

HIGH CAPACITY
The design permits handling exceptionally large volumes. Will accurately control flow rates up to the maximum capacity of 2″ piping.

COMPACT DIMENSIONS
The *most* regulator has been compressed into the *smallest* space. It is constructed for installation simplicity with respect to both dimensions and connections.

VERSATILE IN APPLICATION
There are literally a thousand and one applications including use at town border stations, on industrial burners and large meter settings, for small distribution systems or district pressure control.

ECONOMICAL TO BUY, INSTALL, MAINTAIN
Will frequently do a better job of regulation than larger, much more expensive, specialized types. Screwed connections simplify installation. All parts are fully accessible.

Write for Bulletin 1159

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GAS

REG. U. S. PATENT OFFICE

Twenty-Third Year of Publication

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Highlights

THREE MORE "BIG INCHES" PLANNED. Hearing before the FPC was set to start Oct. 27 on an application of the Trans-Continental Pipe Line Co. to build an 1839-mile line from Mercedes, Texas, to New York City. But that isn't all. Two additional lines to be built by the same company are in the works, according to President Claude Williams of Austin. If approved, the three will cost an aggregate of $450 million and will serve New York, Brooklyn, Newark, and Philadelphia.

ELECTRICAL SALES OUT FRONT. In a Securities and Exchange Commission survey, 24 manufacturers of electrical supplies and equipment led all others in percentage of increase in sales for the second quarter of 1947 over the same period in 1946. The boost amounted to 117%. The survey covered 1243 companies.

PROGRESS IN CONSERVATION. Texas has marked another milestone in its program to halt gas flaring. Last month the last flare in the Old Ocean field was shut off and all active wells were hooked into the gasoline plant there. All residue gas from the plant is being marketed or used for repressuring.

ONE BILLION FEET PER DAY. That's how much gas the Tennessee Gas Transmission Co., Houston, would like to send east from Texas, according to the latest application made to FPC. Now engaged in laying parallel lines which will send capacity of its present lines to 600 MMcf, the company is seeking approval of extra facilities which would push the carry to 1055 MMcf, and would build an extension through Ohio, Pennsylvania, New York, and Massachusetts to a terminal near Boston. Cost would be $150 millions.

TEMPORARY CURTAILMENT REGULATIONS FOR PANHANDLE DELIVERIES EFFECTED. Failing to get unanimous agreement among distributors, the industry committee charged with working out an emergency curtailment schedule for Panhandle Eastern Pipe Line Co. drew up a majority-approved plan which the FPC ordered into effect last month. However, the edict will die Nov. 15, and a new one will have to be drawn up.

CALIFORNIA COMPANY TO STORE GAS IN PIPES. Sixteen storage tanks utilizing 30-in. high-strength expanded steel pipe such as went into the California sector of the Texas-California line are being installed underground by the Southern Counties Gas Co., Los Angeles. Each unit will hold 250 MMcf at a pressure of 440 psi. Seven tanks measure 240 ft., nine measure 180 ft.

PERMANENT BIG INCH OPERATION APPROVED. Texas Eastern Transmission Co. got the "go" signal from the Federal Power Commission last month on its application for permanent operation of the Inch lines. The company won out over coal interests by securing permission to take the gas as far as Philadelphia. The company will also use the remainder of the lines, which extend to Linden, N. J., for storing 60 MMcf for emergency use in the Philadelphia sector.

SUPREME COURT QUASHES TIDELANDS APPEAL. California's petition for a reconsideration of the high court's decision holding that the federal government has prior rights over oil-producing tidelands was refused last month by 6-2 vote.

LABORATORIES HEAD RETIRES. Raymond M. Conner has resigned as head of the AGA Testing Laboratories after 22 years of service. Edwin L. Hall will replace him in the post.

NEW PRESIDENT FOR SOUTHERN COUNTIES. Arthur F. Bridge, vice president and general manager, Southern Counties Gas Co., Los Angeles, was elevated to the presidency of that company Oct. 22. He succeeds F. S. Wade, who retains membership on the board of directors and presidency of Southern California Gas Co.

ORONITE
CHEMICALS
Reg. U. S. Pat. Off.

THE NAME TO WATCH IN CHEMICALS

ALERT—THE CONCENTRATED GAS ODORANT

Because it is *Stable* and *Highly Diffusible* under normal gas conditions, it protects two ways: saves maintenance costs; guards against undiscovered gas leaks.

Alert's pronounced gassy odor stays "put"—½ pound will odorize up to two million cubic feet of gas.

Packed in drums containing 375 pounds—enough to treat 750 million feet of gas—under normal conditions.

ALERT—FOR SAFETY

Authorized Distributors: Humble Oil & Refining Co., Standard Oil Co. (New Jersey, Louisiana, Arkansas, Tennessee), Standard Oil Co. (Kentucky), Standard Oil Co. (Indiana).

TYPICAL TESTS:

Gravity A. P. I.	38.6°
Weight Lbs. per Gallon	6.9
Sulphur	38.8%
Distillation Range (D-86):	
Start	117° F
10%	130
50%	149
90%	208
End Point	280
Recovered	98%
In Flask	1
Loss	1

ALERT...by makers of Calodorant ...the oldest name in gas odorants

1395

ORONITE CHEMICAL COMPANY

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TECHNICAL TRENDS

by Guy Corfield

"McCall's" Goes For Gas

GAS utilization and sales people in particular will get a lift from the three-page article in "McCall's" magazine for October 1947, by Elizabeth Sweeney, household equipment editor, under the all-out title of "It's a Joy to Cook With Your New Gas Range."

The first two pages portray and describe some super-appetizing dishes made with benefit of the plus performance of the modern gas range top section, oven and broiler; the third page, headed "What's New in the New Gas Ranges," describes and sketches the variety of top burner arrangements, white enamel and other easily cleaned burner bowls, and a glass plate as part of a grate arrangement—a new minute minder, lever-type gas burner controls on the back splasher, and an attached "vent cabinet" which collects and removes oven, broiler and top section products by connection to a fan in the basement—and a new design of circular ring broiler pan assembly, and a broiler burner with surrounding metal mesh to extend the radiant effect.

It is such technical developments as these that the post-war era has been awaiting, and it is extremely encouraging to see them not only making an appearance on the sales floor but also receiving such endorsement as afforded by Miss Sweeney.

Petroleum Bacteriology

A process that would have vast practical and economic value may ultimately develop from the findings of Dr. Claude E. ZoBell at Scripps Institute, La Jolla, California, according to an article by Charles J. Deegan in the "Oil and Gas Journal," June 21. Working on a fundamental research program for the American Petroleum Institute, Dr. ZoBell developed data which prompted the procurement of a patent, assigned by him to the API and in turn dedicated free of royalty to the international public.

Quoting from Mr. Deegan's article:

This patent, No. 2,413,278, reveals the following discoveries about certain strains of bacteria:

1. They have the power to strip an oil film from around the outer surface of a sand grain, apparently by physically shouldering it out of the way and crowding themselves so tightly packed around the grain that oil is displaced.

2. They have the additional power to secrete a detergent-like substance which lowers the surface tension of the oil present around the sand to the point where it releases its grip and is freed for recovery through the open pore spaces.

3. They are responsible for the production of acids or acidic substances which attack limestone or limy materials and dissolve them, releasing any oil adhering to these materials, and at the same time forming carbon dioxide gas, which may further aid in recovering the released oil.

4. There are indications that they attack the heavier (and therefore more viscous) hydrocarbons and spit them into lighter hydrocarbons (which are less viscous and flow more freely through reservoir pore spaces).

One area where these bacteriological techniques might be applied is in the Athabaska oil sands in Northern Canada, which is said to contain as much or more oil than the total present proved reserves in the rest of the world. The patent specifically states: "Oil sands from the Athabaska region of Canada have been found to release oil when subjected to contact with a medium of the bacteria. The bacteria attach themselves so tenaciously to solid surfaces that they cannot be flushed away by the ordinary flow of fluids in a formation."

Professional Employees

GAS industry chemists and engineers will be interested in the definition of a professional employee as written into the new Labor-Management Relations Act (Taft-Hartley law). The law states that the term "professional employee" means:

(a) Any employee engaged in work (1) predominantly intellectual and varied in character as opposed to routine mental, manual, mechanical, or physical work; (2) involving the consistent exercise of discretion and judgment in its performance; (3) of such a character that the output produced or the result accomplished cannot be standardized in relation to a given period of time; (4) requiring knowledge of an advanced type in a field of science or learning customarily acquired by a prolonged course of specialized intellectual instruction and study in an institution of higher learning or a hospital, as distinguished from a general academic education or from an apprenticeship or from training in the performance of routine mental, manual, or physical processes; or . . .

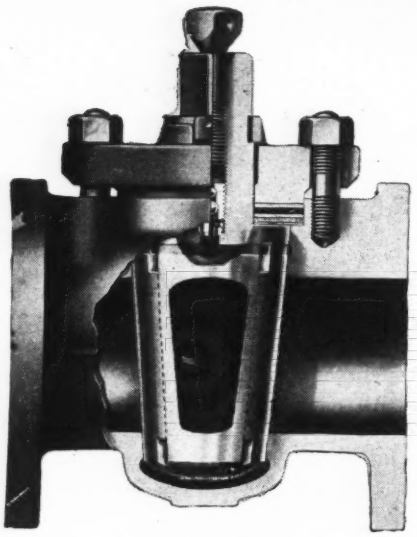
(b) Any employee, who (1) has completed the courses of specialized intellectual instruction and study described in Clause 4 of Paragraph (a), and (2) is performing related work under the supervision of a professional person to qualify himself to become a professional employee as described in Paragraph (a).

LP-Gas Tanker

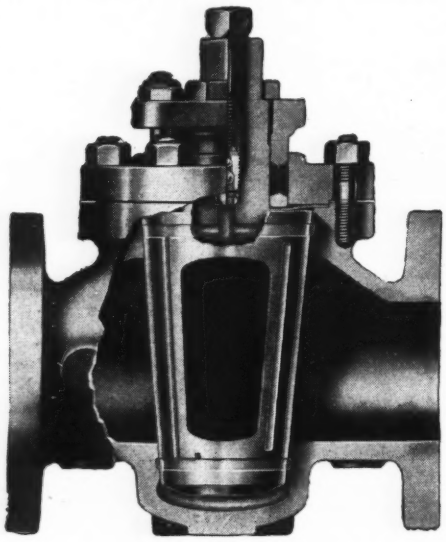
SAID to be the first of its kind in this service, a 16,000-ton tanker has been equipped by the Standard Oil Co. of New Jersey to carry LP-Gas to South America, where the fuel will be sold for use in domestic gas appliances and certain commercial processes requiring accurate temperature control.

The tanker loads direct from railroad tank cars, using its own steam driven pumps to fill and empty specially-built tanks below decks.

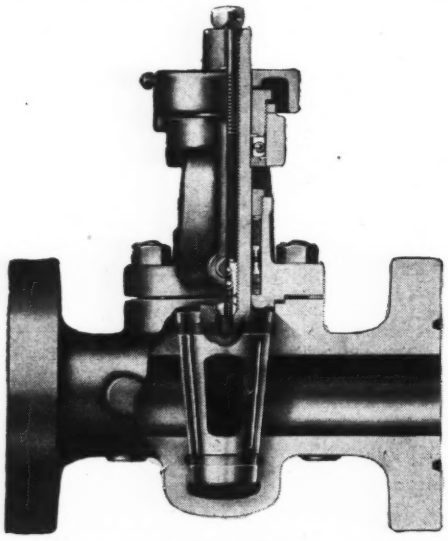
Thus it would appear that LP-Gas is not only becoming widely recognized as a desirable and economical fuel, but is also being found amenable to every method of bulk shipment.



Single Gland Type



Regular Gland Type



Ball Bearing Type

FOR HANDLING

Acids... Solvents... Sludges...

and other troublesome liquids—

Use Walworth Lubricated Plug Valves

When handling acids, condensates, dyes, oils, solvents, solutions, slurries and hundreds of similar "troublesome" liquids, you get better control, more dependable service and lower operating costs with Walworth Lubricated Plug Valves.

These valves have proved their ability to give easy operation . . . fast action . . . tight shut off . . . greater protection against corrosion. Turning is smooth and easy; just a ¼ turn from full-opening to full-closing. Moreover, Walworth Lubricated Plug Valves are tightly sealed against leaks — *whether open or shut.*

Walworth Lubricated Plug Valves are available in sizes ½" to 24" for pressures from 125 to 5,000 psi, and for vacuum requirement. For further information about Walworth's Complete Line of Lubricated Plug Valves, see your Walworth distributor or write for Catalog No. 46L.

WALWORTH

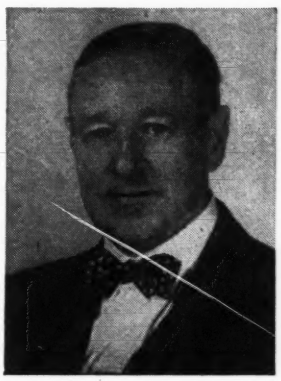
valves and fittings

60 EAST 42nd STREET, NEW YORK 17, N. Y.

PROMOTIONAL NOTES AND NOTIONS

by Stanley Jenks

United Effort



IN the lobby of the Philadelphia bank where I try to keep a couple of dimes intact for a rainy day, I saw a heart-warming display of gas industry enterprise. There were six makes of automatic gas storage water heaters *very* prominently displayed. So prominently, in fact, that you couldn't possibly get in or out of the bank without seeing them.

With the display, there were available (1) a piece of literature describing FHA property improvement loans, (2) another printed piece listing the names and addresses of 49 plumber dealer members of The Retail Merchant Plumbers Association of Philadelphia, and (3) a stamped post card for anybody interested, to address to any of the merchant plumbers listed.

The bank itself invited the would-be purchaser to finance the installation through its Time Sales department, and the merchant plumbers urged that the water heater be bought installed.

It pleased me that our Philadelphia Gas Works has 49 *merchant* plumbers (I like the "merchant" label) as active promotional allies, and that the combined resources of the federal government, a large banking institution, and gas appliance merchants are co-ordinated to make it easier for Mr. and Mrs. John Q. Public to acquire up-to-date gas appliances.

Going Ahead

REPORTS from the recent AGA convention at Cleveland indicate that the gasification of the United States is proceeding as well as might be expected, thank you. Despite material shortage "bottlenecks," we are selling all the gas we can distribute through additional appliances as fast as our manufacturers can turn them out. And judging by the appliance shipments recently released by GAMA, we are making considerable headway in our plans to modernize existing installations to insure load continuity in the face of future fuel competition.

The automatic water heater shipments are amazing—937,700 units during the first six months of this year. How the picture has changed for the better during the last 25 years!

The gas industry is fortunate that it has water heater manufacturers with (1) combined annual capacities of approximately 2 million units, and (2) the production facilities and "know how" to build so much quality into these units at such a low cost. The manufacturer's average price per automatic storage water heater is only $45.50, according to the GAMA figures.

I submit that an automatic storage water heater, complete with a heavily insulated tank, thermostat and safety pilot, with years of carefree, dependable, economical service built in it, at such a price is a real accomplishment.

The industry is indebted to all its manufacturers, whose only expectation is a free field, non-discrimination in local utility promotion, and a fair profit.

Utility self-interest requires that they should get them.

Defining Salesmanship

HARRY Boyd Brown, president, Good House Stores Inc., says he is all for high-pressure retail salesmanship. So long as we agree on a "high-pressure" definition, so am I.

Mr. Brown told the AGA convention at Cleveland, in his excellent and timely reminder (the retail salesman is the lad who really counts), that "by high-pressure selling, I mean salesmen knowing the merchandise or service they have to sell, knowing it thoroughly and being enthusiastic about it. I mean the salesmen who drive hard and intelligently every minute to sell their product, because they know that it is what the consumer needs and they can prove it."

Mr. Brown nails down his definition by stating that his "high-pressure" selling is not making false claims, misrepresenting by tricky wording, or selling people things they should not have and cannot pay for.

In other words, his "high-pressure" selling is the kind we all want in the gas industry, and which can only be had by intensive training and intelligent, alert supervision.

It's Only —

IT'S *only* $259.95.

What? Why a range that cooks so easily and fast, it's almost automatic.

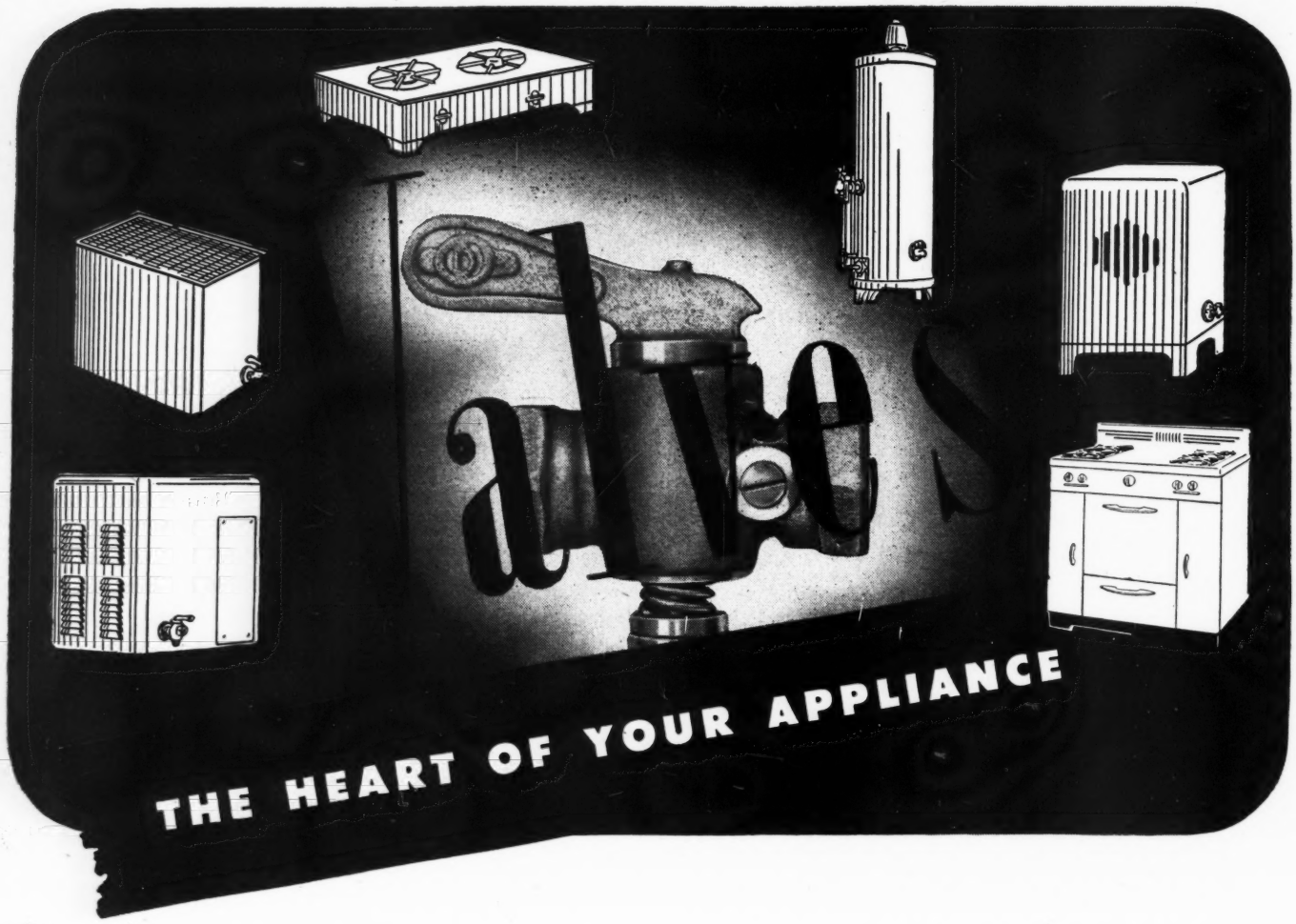
That's what it says in the electric range advertisement in our local newspaper this morning.

It's *only* $259.95. The illustration shows a regular 4-top burner, ordinary kitchen style job. But it's *almost* automatic. I wonder how much the additional cost for installation is.

Such is our competition these days. Price-wise, quality-wise, and durability-wise, we have with our CP ranges every ace in the deck. Yet, they will sell some of these electric ranges and we will be the losers. They'll find some Mr. and Mrs. John Q. Public still unconvinced that "Gas Has Got It." They'll find some woman who has never been exposed to the many advantages of the modern gas range, and, poor simpleton, she'll wear an electric halo as she floats around in the clouds of her self-ignorance simply because one of Mr. Brown's "high-pressure" gas range salesmen passed her by.

Let's hope she's few and far between by the time the national and local "Gas Has Got It" promotional program has really got into stride.

In the meantime, it's *only* $259.95.



BE SURE THEY'RE THE BEST

Your appliance is as good as the valves you use. Ultimate consumer reaction is influenced by valve efficiency and dependability.

Materials, workmanship and engineering knowledge incorporated in your appliance demand valves of comparable calibre—valves that not only enjoy the long-standing recognition accorded to Detroit Brass products, but also valves backed by the assurance that they are designed to perform for the life of your appliance. That's why we say—

BE SURE THEY'RE DETROIT BRASS

GAS VALVE DIVISION

DETROIT BRASS & MALLEABLE WORKS

DETROIT 9, MICHIGAN

FOR GOOD INDUSTRIAL RELATIONS LET FOREMEN DO THE PERSONNEL JOB

By GUY WADSWORTH

Vice President
Southern California Gas Co.

IT would be a natural expectation that a discussion of current industrial relations problems should center about the provisions of the Taft-Hartley bill, and particularly about collective bargaining issues that are in the immediate offing as a result of its enactment. If we have learned anything from past experience, however, it is clear that even a well turned pronouncement on what is going to happen as a consequence of some new turn of events in the industrial relations field is usually ill advised.

The plain fact is that the Taft-Hartley Bill is new and untried. Union spokesmen have generally denounced it, and have broadcast an intention to live outside its provisions. Managements, praise be, have thus far shown a disposition to let matters develop. This is neither the time nor the place to spoil such a good record.

There is, nevertheless, one basic problem that is always with us in industrial relations that can be discussed without speculation or second guessing. It has to do with individual happenings on the job that, in the aggregate, determine the tone of industrial relations in any company.

While a decade or more of intensive organizing and collective bargaining activity has served to emphasize much that is negative in relations between employers and employees, there is still considerable convincing evidence that the average worker prefers to think well of his job, and of the company for which he works. He is encouraged in this, or discouraged from it, depending largely upon what happens to him as an individual in the course of his daily work.

Where the reactions of the average worker to his job and to the conditions that surround it are on the whole friendly and constructive, the climate in which collective bargaining occurs lends itself to calm discussion, and to reasonable settlement of issues. Where the job has become the focal point of frustrations and resentments to any considerable number of people on the payroll, the course of collective bargaining assumes an entirely different, and certainly less desirable, tone.

Probably no one who primarily represents management is qualified to speak for the employee in the ranks, nor can he be absolutely certain as to what the average rank and file worker has on his mind. However, the experience of meeting and dealing with employee representatives over a period of years leaves certain impressions.

For one thing it is obvious that most of the employees who appear at the collective bargaining table want the good opinion of the people on both sides, and few of them really enjoy trying to carry water on both shoulders. They want to look out for the people they represent, but they do not want to lose personally by it. I think most of them feel that pressure from some source or other for higher wages is a practical necessity in these times, but I do not believe that the majority of them really like radical leadership, or want an open state of war with their employer.

Of one thing I am certain. That is if all of the petty grievances and minor complaints, that could be intelligently disposed of on the job, were so handled that they would not figure in the annual bill of collective bargaining demands, there would be hardly anything left to talk about but the money.

A great many industrial relations men will probably agree with me that the strictly economic issues that come up in collective bargaining, considered by themselves, are not materially different from those involved in making a business deal of any kind. It is true that the pressures assume a different form, and that the trading is at times more emotional than it is in the ordinary transaction between a buyer and a seller.

What really bothers us is the number of times that concessions have to be made to correct situations that arise outside of these economic issues —particularly situations that do not have to exist. I refer to hard and fast conditions that are placed about certain phases of employment, promotions, discipline and the like, because, at some critical point in negotiations, the union representative is able to turn up specific instances in which promises of a much more general character made by the company have been violated on the job.

It should be evident at this pass that unions, by and large, seek to shift

Presented at the Pacific Coast Gas Association convention at Coronado, Calif., Sept. 23-25.

the control and direction of a company's working forces from the employer to themselves. They are also constantly on the prowl to turn up proof that the average worker does not get a fair break from his boss, unless his boss is circumscribed by fixed rules established at the instance of the union.

The practical state of industrial relations in any company depends far more upon the degree of control that the union succeeds in establishing over ordinary happenings on the job, than it depends upon the outcome of negotiations on strictly economic issues. A simpler statement of the case is that when the average worker comes to the point that he looks to his union rather than to his boss for a fair deal, good industrial relations go out the window. Unhappily the boss himself all too often furnishes the ammunition that brings this about.

The best answer we have to this sort of thing is a superior order of personnel management. By this I do not mean a larger personnel department, or one clothed with greater authority by the head of the company. No management job succeeds by reason alone of the authority behind it—if this were the case a top executive would only have to give orders, and things would get done.

What I have in mind is an order of personnel management that recognizes that the personnel job that really counts is performed, not in the personnel office, but by the individual supervisor out where the work of the company goes on. If the foreman does not apply sound personnel principles in the ordinary situations that develop from day to day on the job, even a brilliant performance at staff level by the personnel department will not materially influence the industrial relations of the company. In speaking of the foreman, of course, we refer to all front-line supervisors who deal directly with the rank and file employees.

Personnel work itself got off to a rather poor start in this regard. Originally it included primarily the functions of an employment office, but later on the rumor got around that the personnel man was also supposed to tend single-handedly to the human end of the business.

On this basis the personnel man maintained an "open door" to all comers, and did what he could to encourage the employees at large to come to him with their troubles. Likewise he gained some dubious degree of popularity with the supervisors—who incidentally did not like the "open door" idea very much—by offering to fire people that the supervisors themselves did not have the nerve to fire.

Foreman in Front Line

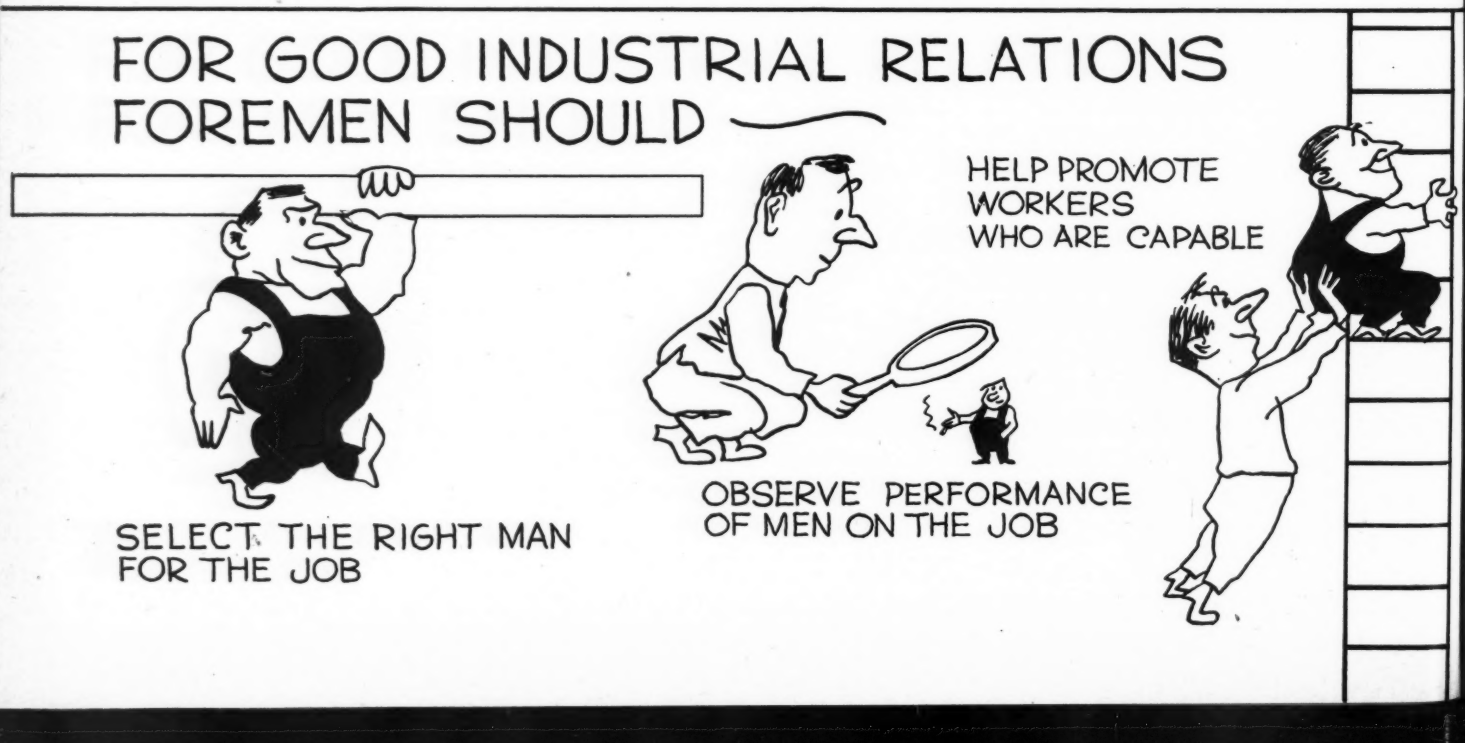
In a word the personnel man originally tried to run a species of clinic for out patients, and, in addition, performed an assortment of good works on request. That the bulk of these activities did not have a great deal of effect upon the attitude of the average worker toward the firm became thoroughly apparent when the union organizer arrived on the scene.

As of today, there are more and more personnel men who recognize that their primary mission is to secure good results in industrial relations largely through the efforts of other people. In general, such personnel men have a well-turned conception of what needs to be done, but their big problem is to get these other people, who, of course, are the foremen, to do it. There has always been a latent suspicion that anything that smacks of supervision and guidance of the foreman in any matter so intimate as his immediate relationships with his subordinates deprives him of the authority he needs to get a job done. This often proves to be the great barrier to effective personnel work.

The plain fact is that in the nature of ordinary operations in most business organizations, the foreman, whether he knows it or not, makes most of the determinations that affect rank-and-file employees of the company as individuals.

His views on how many people are needed to get a job done, while not always final, play an essential part in deciding how many individuals are to have jobs. He decides what kind of people are needed by the manner in which he lays out the work, and he usually and properly exercises final choice of applicants for new jobs. He defines the employee training problem inasmuch as the need for such training originates at the job level. He is the only one situated to judge how well or how poorly the individual employee performs his work, and he originates the recommendations or furnishes the basic information whereby reassignment or promotion of rank-and-file workers is effected. He decides wages and salaries in the sense that he often personally lines up the content of jobs. Even when he does not, he certainly makes the individual employees perform work that is within their respective payroll classifications. He is largely responsible for the job environment, and for the morale of employees who report to him, insofar as the manner in which he exercises his authority affects that morale. He decides those who go, and those who stay on the job, directly or indirectly.

Within this array of responsibilities and practical authority of the foreman are encompassed virtually all of the situations in which the average rank-and-file worker receives attention as an individual, and it is proper that this should be the case. But it is


FOR GOOD INDUSTRIAL RELATIONS FOREMEN SHOULD
SELECT THE RIGHT MAN FOR THE JOB
OBSERVE PERFORMANCE OF MEN ON THE JOB
HELP PROMOTE WORKERS WHO ARE CAPABLE

also essential that the foreman should know what he is doing at every step in the way, which means in turn that he must become a pretty good personnel man in his own right.

It can be added that the methods at hand to equip the foreman with what he needs to know to do a good personnel job neither interfere with operating line authority, nor do they impose new burdens upon the foreman's working time. Actually he has a personnel job to perform in any case, whether he does it well or poorly. The time he devotes to getting the individual worker off to a good start, to getting facts, and to analyzing problems of the job before he takes action on them is less of an imposition upon him than the time and loss of face often involved in backtracking, and correcting mistakes.

Even before these methods can be placed at the disposal of the foreman, however, the personnel man must work on his own thinking and that of other supervisors and executives up the line. When the personnel man says that the bulk of the personnel job inevitably must be performed at the working level, he must really mean it, and what he actually does about it must be consistent with this belief. Otherwise he will merely develop one more situation in which the foreman is told that he represents management, but in which people up the line actually watch him so closely and become so upset when he makes a mistake that he really is not allowed to develop any worth while thinking of his own. This, incidentally, is apparently the inherent problem of all real delegation. It falls flat when the executive up the line lives in mortal horror of all mistakes except his own.

So everyone involved in the total effort to prompt the foreman to do a good personnel job must make up his mind that once the foreman's personnel responsibilities have been spelled out for him, he must be permitted to discharge them. This carries with it the right to learn something from an occasional bad pass, just as the boss up the line has learned a good deal that he knows from making some mistakes. Over the long pull, if the foreman really knows what he is about, there will be fewer and less costly mistakes affecting individual employees than if people who have little direct knowledge of immediate job situations try to run the show.

What are the situations in which the performance of a good personnel job by the foreman represents a sound bid for good industrial relations? Well, in general they are the same as those in which the personnel man has traditionally tried to achieve results by remote control.

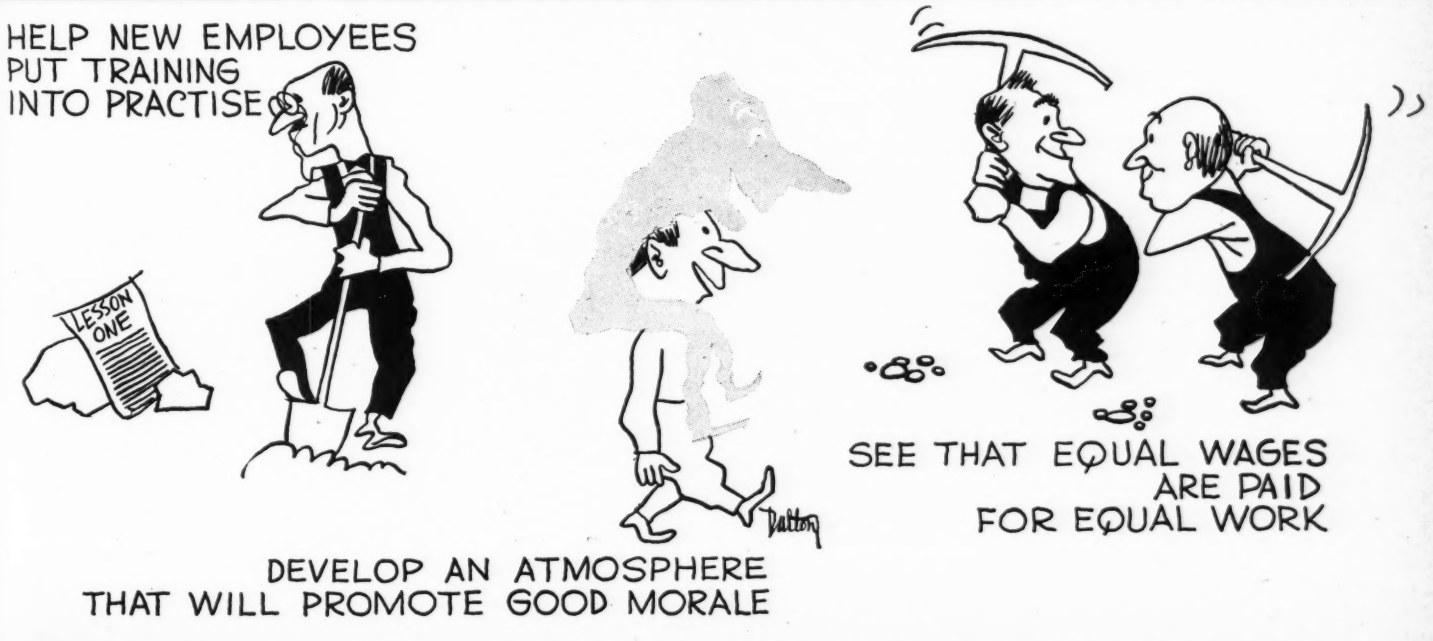
First, the foreman has a vital part to play in the selection of the right man for the job. Whatever refinements are used in the personnel office in clearing new workers for employment, the real test of a hiring is what the new worker actually does or fails to do, once he is placed on the job.

By and large, there is no grievance as bitter as that of an employee who has never been fully successful in his work, but who, while denied the recognition that goes with making good on the job, has nonetheless been kept indefinitely on the payroll. We usually find in such instances that no supervisor for whom the employee has worked has had very much good to say about him from the first—but the employee himself has a first class grievance that is usually levelled against the actions of his immediate boss.

Most companies have a probationary period of employment that applies to new workers, which is a recognized part of the employee selection process. The foreman is the only one actually situated to put this probationary period to its proper use. He must make a considered final recommendation as to whether or not individual candidates for jobs should be hired on a long term basis. He should be fully posted on the fact that it is up to him to exercise this "right to hire" by making a positive determination one way or the other. He should be given a bill of particulars on what to look for, and how to report and get action on what he finds.

Second, the foreman must continuously keep track of the performance of each worker who has been finally accepted, so that when some problem arises in connection with the work there will be no confusion over who did what, or who failed to do it, when it happened, and so on. He posseses no sixth sense that enables him to do this job without painstaking day-to-day observation, and a disposition to look again when he feels most sure of himself. He cannot possibly give credit where credit is due, or administer discipline when it is needed, unless he is far more sure of his facts than he often proves to be when his subordinates bring grievances against his actions.

The evaluation of employee performance is no simple, cursory task that can be accounted for by requiring the foreman to fill out a formal efficiency report, or check item rating device once a year. The average foreman will go through motions of this routine with about the same relish that he takes in filling out his own personal income tax return, and usually in about the same proximity to the deadline. Fairness and factuality in evaluating employee performance must be instilled into his working habits. It can be done by showing the foreman how it helps him to get out the work, and how it helps him to avoid situations


HELP NEW EMPLOYEES PUT TRAINING INTO PRACTISE
LESSON ONE
DEVELOP AN ATMOSPHERE THAT WILL PROMOTE GOOD MORALE
SEE THAT EQUAL WAGES ARE PAID FOR EQUAL WORK

in which he can embarrass himself by being caught short on facts.

Third, the foreman must play a part in planning promotions and transfers, so that promotions are made with some assurance that the employee can handle the next job up, and so that transfers will savor somewhat less than they often do of the well-known interdepartmental game of "pass the lemon." Even when promotions and transfers are restricted by seniority or on some other basis, the foreman is usually situated to exercise at least a veto over promotions and job changes. He must elect either to act, or to stand by and let promotions go by default.

One of the most badly needed elements in personnel supervision is a disposition on the part of the foreman to look ahead on behalf of individual workers, and to plan the assignment of particular jobs in such a way that given workers are placed in line for assignments in which there is some reason to believe that they can succeed. Perhaps the most ancient of all grievances, and the one that pays off for the union most frequently, is that of the worker who has reached his limit, but who nonetheless has been placed in a job that in appearance puts him in line for a promotion for which no one really intends to consider him. When such a worker is by-passed, perhaps on several occasions, the affront is not only personal to him, but becomes a common cause of complaint to other employees who fear the same treatment.

The foreman is better situated than anyone else to review periodically his working force and to cast up a balance sheet to see where he stands in relation to understudies for key jobs, replacement of employees he is likely to lose, and with respect to employees who should make good or make room. Until his intimate knowledge of individual employees is brought generally into play in such matters, it is going to be difficult to make the average employee feel that his possibilities actually receive individual consideration.

Fourth, the foreman has a training function which he can discharge only if he understands sound principles of instruction. Even when completion of some degree of formal training is a prerequisite to assignment to a particular job, someone must show the new employee how the skill thus acquired should be put to work. As an opinion, Job Instructor Training, or some equivalent, should be given to every foreman in the company, supplemented by adequate steps to ensure active application on the job of the principles of instruction spelled out in that course.

There is probably no situation in which the foreman has a better opportunity to establish constructive relations with individual workers, than in helping them to succeed on the job through training. His action in doing this can do much to dispel the conception that a boss merely presides over his workers, and delights in taking them to task for mistakes.

Fifth, the foreman has a responsibility for what might be termed the atmosphere that prevails on the job. When we think of positive efforts to develop good morale within a working force we are likely to focus our attention on the Coca Cola bar, the recreation facility, the company baseball team or perhaps the turkeys we pass out at Christmas. But the actual state of morale is likely to be determined, not by these things, but by the steps the foreman consciously takes to create understanding where the contrary could easily prevail, and by the light-handed use of authority where he could easily throw his weight around. There is no so-called morale move that can produce a relationship with employees which is any better than that which exists in ordinary dealings on the job.

The best of management policies and the most sumptuous of employee facilities cannot correct any really bad impression of the company that is created in the daily work. Job Relations Training is built about this principle. It is my opinion that the average foreman is very likely to be the kind of a boss that he is often accused of being unless he is given such training. It helps him to do a thoughtful job in meeting ordinary problems, in correcting workers constructively, and in generally learning how to review an action before he takes it.

Sixth, the foreman has a responsibility for observing the principle of equal pay for equal work. A great deal of progress has been made in recent years in setting up machinery for bringing wages and salaries into line, and in relating rates of pay to the best picture we can get of the content of jobs. Yet the best salary administration system going cannot succeed unless the foreman really understands it, and works with it.

The rank-and-file employee, like the rest of us, has a way of being discouragingly commercial about things that affect his pocket book. One measuring stick he uses to determine whether or not he is getting all that is coming to him is the amount of his pay check, in relation to the amounts received by other employees who do the same work that he does. There is reason to believe that, if anything, he becomes more aroused over evidence that he gets less than someone else who performs the same work, than he does over the pay rate itself.

This is an old story to anyone who has dealt with classification grievances. If the foreman cannot help us to lick this particular problem, and if he cannot subdue what is apparently a deeply imbedded penchant for realigning job duties without telling anybody, the union will continue to dig for gold, and to find it in faults of the foreman's own making.

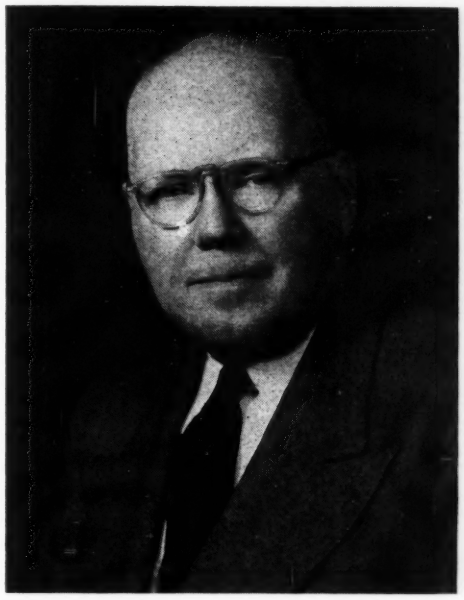
These situations in which basically good industrial relations depend primarily upon the performance of an adequate personnel job by the foreman, as we have discussed them, present nothing new or startling. Yet possibly the best test of the potential effectiveness of any effort to create a constructive reaction on the part of rank-and-file workers toward the company lies in the extent to which the foreman actually plays his proper part in placing individuals in jobs in which they can succeed; in evaluating their performance fairly and factually; in looking and planning ahead in their behalf; in training them as needed; in dealing with problems that affect them on a basis that represents a bid for good understanding rather than the contrary; and in paying them equitably for their services.

Give Employee Break

The individual employee whose immediate boss gives him the best break he can in all of these respects is unlikely to indulge in discontent for its own sake. If the foreman is not actually used as the front line in industrial relations, or if he is in fact bypassed on the basis that wiser heads than his are needed to cope with these problems, the individual worker is likely to get lost in the scheme of things along with the foreman himself. The worker then turns to folks on the outside who will help him to get what he wants.

I think that is the basic industrial relations problem of the utility companies. Some of us believe that the Taft-Hartley Bill, which I promised not to discuss, provides some basis for working more closely with individual employees, and to some extent winning back the understanding that was ours before the Wagner Act rang down a none too synthetic iron curtain on normal relationships between boss and worker. If we are to succeed in this, it will be because of the attention paid to the basic relationships that have been discussed, and not because we are presently situated to bargain with unions on somewhat more even terms.

An evaluation of prospects of fuel supply and demand in the near future



By MAX W. BALL

Director, Oil and Gas Division
U. S. Department of the Interior

Needed: A Proper Fuel Price Relationship

TALKING about tomorrow is always a risky business. Some alliterative soul has referred to "the perpetual perils of prophecy." I should like to lessen those perils as much as possible, first by trying to base my predictions about tomorrow on the facts of today, and second by stating at the start two premises about which I make no prophecy; they are assumptions, not predictions.

The first premise is that, during the period covered, we are not at war. The second premise is that we have no material decline in present and prospective economic activity. War would materially increase our fuel needs; a serious recession might lessen them.

Assuming these two premises, what is our fuel outlook?

I shall waste no time trying to tell gas men about the natural gas outlook for this winter. But—what about oil and coal?

Oil for This Winter: It is no news to most of you, moreover, that your customers cannot shift their load from gas to fuel oil; that fuel oil, this winter, will also be in tight supply. The refineries of the United States and in the Carribbean area are working miracles. Without steel for needed expansion, by resourcefulness and ingenuity, by unexampled engineering and operating practices, and by sheer determination, they are processing crude at a rate well above what a year ago was considered their maximum capacity, and this despite the sad fact that some refineries are shut down and some are running at less than capacity for lack of crude.

Neverthless, stocks of heating and fuel oils east of the Rockies and north of the Gulf Coast are less than they were a year ago, although demands are greater. Stocks were barely adequate, with day-to-day refinery output, to pull through last winter without serious hardship. Indications are that this winter's demand for heating oils will be from 20% to 40% greater than last year's, yet we enter the heating season with less in storage.

A shortage of tankers, on which the East Coast depends for both crude oil and products, threatens to aggravate the situation in the North and Middle Atlantic states.

Unless autumn spends the winter in the Middle West and on the East coast, cold spells will bring shortages here and there throughout the area. Industries may be shut down, men may be out of work, and homes may be unheated for lack of fuel oil or gas. The plight of some of those who have installed new oil burners without firm assurances of supply from reliable fuel oil dealers may be especially tough.

Reasonably mild weather and the herculean efforts of the oil and gas industry may keep such local shortages from being more than local and of short duration.

Coal for This Winter: The chilly outlook is not warmed as much as we might hope by contemplating coal. It too threatens to be in tight supply, though not so tight, fortunately, as oil and gas.

Here again the bottleneck is transportation. We are told that there is adequate mining capacity and adequate labor to produce the coal needed for the United States plus the unprecedented tonnage needed for export. There are not enough coal cars, however, to keep the mines running at the required rate. The mines cannot produce coal faster than the railroads can haul it away, and despite the efforts of the railroads, the car-building companies, and the Offiice of Defense Transportation, the railroads have not the cars to haul it away as fast as it is needed. Approximately 46,000 coal-type cars are on order, but shortage of steel has kept output to about the number that from month to month wear out and have to be scrapped.

This restriction of output comes at a time when stockpiles are abnormally low because of the work stoppages of the past two years, which have cost millions of tons. Many industrial consumers, including steel companies, are already uncomfortably close to the

Presented before the Natural Gas Department of the American Gas Association, Cleveland, Oct. 7.

A good measure of Max Ball's popularity in the industry is accounted for by his background, which includes experience in nearly all phases of gas and oil operations both as a businessman and a government servant, and which affords him insight into many of the problems of operating men. His appointment last year to succeed Ralph K. Davies, who was then acting director of the Oil and Gas Division, was hailed throughout the industry.

His career includes duties as chairman of the Oil Board of the Geological Survey, engineer and law officer of the Bureau of Mines, manager of exploration in the Rocky Mountain region for the Shell Oil companies, president of the Argo Oil Co., and special assistant to the deputy administrator of the Petroleum Administration for War.

He holds both law and engineering degrees, the latter from the Colorado School of Mines.

bottoms of their bins, and here and there a blast furnace or an open hearth has been shut down for a few days for lack of coal. The supply of anthracite, 80% of which goes into house heating, threatens to be several million tons short of demand in New England.

Elsewhere the consumer of coal, whether industrial or domestic, may have to scour the market at times this winter, and may have to accept a different kind of quality than he would like, and may now and then be short for a few days, but on the whole he will probably be able to fill his minimum needs, barring calamities.

The Five-Year Outlook

WHEN we get through this winter, where will we be? What are the prospects for the next winter and the next and the winter after that?

Gas: As for gas, some pipe will be available and some pipe lines or major loops will doubtless be built next year. In 1949 more pipe should be available and more lines should be completed. By 1950 the gas situation should have eased materially in many localities that will be short of gas this winter and next.

How soon enough lines can be built to catch up with the growing demand of all markets now served with natural gas is another matter. As I shall emphasize later, *whether and when supply overtakes demand may depend in large part on the price of gas in relation to the price of other fuels.* In any case, demand seems certain to keep ahead of supply for some years.

One other thing seems certain: that even when, or if, present market areas are fully satisfied, great markets now unserved along the Eastern Seaboard and in New England will still be far from saturated.

Domestic Oil Supply: As for oil, the situation looks tight for at least five years, perhaps longer. Additional pipe lines will bring some more crude and products into the Middle West next year. Additional refining capacity will be built as fast as steel becomes available. It is doubtful, however, whether expansion in pipe line and refining capacity can do much more than keep step with growing demand. And through every calculation runs a basic question: *Where is the crude to come from?*

There is lots of oil yet to be found in the United States, probably as much as has been found already. Give the wildcatters the steel and the money and they'll find it.

How long they can find new oil at a rate equal to the increasing rate of consumption is another question. With a fixed number of fields to be found when the search started, and with the odds obviously calling for finding first the easiest types to find, the law of diminishing returns is bound to start operating sooner or later. I do not believe that we can continue indefinitely to find oil in the United States at an ever-increasing rate. I am not sure that, except for an occasional spurt of luck, we can find it as fast as we use it from here out.

Foreign Oil Supply: Outside the United States, in South America and the Middle East, are newer, greener pastures where the threat of the law of diminishing returns is still in the dim distance. From these areas must come, and eventually will come, whatever part of our requirements our own fields are not able to supply. Before they can ease our fuel situation, however, two things are required, time and steel.

The developed fields of the nearest prolific source, the Caribbean area, and in fact those of the rest of the Western Hemisphere, are in the same situation as those of the United States: they are already close to their maximum efficient rates of production. Both time and steel will be needed to find and develop new fields. Time and steel in still larger quantities are necessary in the Middle East, which must be equipped with long pipe lines that will take two or three years to build, or, alternatively, with large numbers of tankers that will require as much steel and even more time. We cannot look to foreign sources for any quick easing of our oil supply problem.

The best estimate we have so far been able to make, based on figures from leading economists of the oil industry, is that as far ahead as 1951 the Eastern Hemisphere will still need 500,000 barrels a day from the Western Hemisphere, about the amount that it now gets.

Coal: As for coal, there is ground for hope that from now on the output of coal cars will exceed the number scrapped. In that case each winter should see an increased supply. How soon the increasing supply of cars will permit the industry to fill all American demands, adequately and on time, will depend on how much coal must be exported; how much must be spared to suffering countries whose economies cannot be rebuilt without it. This depends, in turn, on how long it takes to restore, re-equip, and reinvigorate the coal industries of Europe. From what competent American engineers have told me about the magnitude of that job, I doubt that coal will be in abundant supply in the United States for three or perhaps four or possibly five years.

Price Relationships

LOOKING still farther into the future, but including the next few years that we have been discussing, I should like to suggest some thoughts on the relationship of supply, demand, and price, as among the three fuels, and their possible effects.

The prices of coal, fuel oil, and gas have not kept step, as you all know. To get an idea of changing relationships I have taken three Middle Western cities, not too close to sources of supply of any of the three fuels—Minneapolis, Des Moines, and Detroit. For comparative purposes I have taken high-volatile eastern coal with a fuel value of 13,300 Btu's per lb., No. 2 fuel oil at 140,000 Btu's per gal., and house-heating gas converted to a 1000-Btu basis.[a]

From June 15, 1944, to June 15, 1947, the average coal price in the three cities went up 16.4%, the average heating oil price was up 30.4%, and the average gas price went down 11%.

These changes do not bring parity in the cost per heat content. At the 1947 prices the cost per 1 million Btu's is 50 cents for coal, 61 cents for gas, and 74 cents for heating oil. The cost per heat unit for gas and oil, on these figures, is materially higher than that for coal.

The gas cost I have used, however, is for almost the highest-price use, that for residential heating. Much industrial gas is sold for 20 and 25 cents cents per Mcf instead of 61 cents; some is sold for even less. Coal and oil for industrial use command no comparable discount below prices for house-heating use. If we had the average prices of all sales of the three

a Coal and oil prices and cost per million Btu's for gas for the three cities were taken from reports of the Bureau of Labor Statistics. Gas prices are from Brown's Directory for 1944 and the AGA Rate Book for 1947, taken from the step starting with 4 Mcf of the residential rate. These were averaged arithmetically, without weighting, by the author.

fuels in the three cities, we might well find gas the cheapest per Btu.

If we had the figures on comparative increases in consumption for the three fuels, we should undoubtedly find that percentagewise the increase in consumption of oil and gas has been materially greater than that of coal. It is safe to say, moreover, that if all three fuels were in free supply, with no restrictions as to installations and use, and with present price relationships, gas consumption would have increased by the greatest percentage of the three. This would be the case, I think you will agree, not only in the Middle West but virtually everywhere in the United States, given the same or similar price relationships.

We are not wholly dependent on speculation in the matter. In 1945, "Fueloil and Oil Heat" conducted a sampling survey of fuel preferences in 20 cities in New England, the Middle Atlantic States, the Middle West, and the Pacific Northwest. The survey showed that four times as many people as now use gas would like to use it, compared to less than 1½ for oil, and that only one-third of those who now use coal prefer it to oil or gas.

Price is the Final Factor

Price is not the only factor in fuel preference, of course. *A great many people who now use coal would use gas if they could get it, even though it cost materially more.* I need not dwell on this to you. You know all the arguments for gas over coal regardless of cost. You use them effectively on your prospective house-heating customers—or you did when you had the gas to sell them.

You have found these arguments less than effective with prospective commercial and industrial customers, however. To them you have had to talk dollars and cents, and the dollars and cents you get from commercial and industrial consumers are important parts of your incomes. It is not gas men who make the mistake of thinking exclusively in terms of house-heating.

Neither do gas men make the mistake of thinking that house-heating demand is independent of comparative costs. They will not be surprised that, in the "Fueloil and Oil Heat" survey, 56% of those who preferred some other fuel to gas gave as their reason that gas is too expensive.

The demand for gas is no different from that for any other commodity. Various factors affect it—convenience, cleanliness, and others—but the basic factor is comparative cost.

The increasing demand for gas of the past few years, then, and the pent-up demand that would be released if gas were fully available, can have only one meaning, and that is this:

In most natural gas markets we have already reached and passed the price relationship at which gas is in competitive balance with other fuels, and beyond which, when a free choice can be made, gas will be burned instead of other fuels.

What will happen if the price of coal and oil continues to go up and the price of gas in consuming markets continues to go down? What will happen, for that matter, if the present price relationship is maintained indefinitely, so that industries and individuals use gas instead of other fuels, if they can get it? Only one thing can happen. Eventually, when facilities can be built, most of the fuel load of the United States will pile up on the back of gas—and gas is not big enough to carry it!

It is true that the United States has tremendous known gas reserves—148 trillion cu. ft., according to the best authority. It is true that at present rates of consumption these reserves

Laboratories Director Retires

CULMINATING 22 years of distinguished service to the American Gas Association and a total of 32 years to the gas industry, Raymond M. Conner retired Nov. 1 as director of the association's Testing Laboratories. He is being succeeded by Edwin L. Hall, coordinator of gas production research and secretary of the General Research and Planning Committee of the AGA.

Mr. Conner's retirement was occasioned by ill health, the AGA reported. He will be retained as laboratories consultant.

Serving as director of the laboratories since their founding May 1, 1925, Mr. Conner has built them into a world-famous institution dedicated to the setting up of standards and requirements for safety, durability, and dependability for the protection of buyers of gas appliances and equipment. Under his leadership, more than 31,000 performance tests have been conducted by the laboratories at their two locations, in Cleveland and Los Angeles, and the laboratories have won many honors. In 1941, Mr. Conner was awarded the Walton Clark Medal of the Franklin Institute; in 1939 he was made the first recipient of the award of the Gild of Ancient Supplers, and during World War II he was awarded a certificate of recognition by the American Standards Association for the laboratories' contribution to the development of war standards.

Mr. Conner began his career in the gas industry in 1915, when, upon graduation from Oregon State College, he joined the staff of the Portland (Ore.) Gas and Coke Co., eventually becoming manager of the utility's appliance testing laboratory. In 1924 he was awarded the Gold Medal of the Pacific Coast Gas Association for his work as chairman of the committee charged with preparing a gas appliance testing code.

RAYMOND M. CONNER

. . . after 22 years

Mr. Hall has been with the AGA since 1945. Last August he was appointed secretary of the General Research and Planning Committee under the new and enlarged program now being launched by the industry. Graduating from Ohio State University in 1924, he joined the United Gas Improvement Co. as cadet engineer. In November he was transferred to the Syracuse Lighting Co. where he supervised operation of water gas sets. After serving in various capacities with UGI, in 1929 he was transferred to the research department where he collaborated in the development of refinery oil gas reforming processes and heavy oil processes. The latter are now used by several large utilities. From 1936 to 1940 he was in charge of development of a large engineering laboratory at UGI, and from 1940 to 1945 was manager and treasurer of the Manchester (N.H.) Gas Co.

would last some 30 years. It is undoubtedly true that large additional reserves will be found. But this is also true, that these great reserves will not last long if a major part of the fuel demand of the United States is centered upon them.

What is the remedy? NOT regulation of end use, of that I am convinced. Down that road, in my opinion, lie confusion, regimentation, and stagnation. I hold in high respect the ability of government servants, particularly that of my friends in the Federal Power Commission, but I cannot conceive of a government agency wise enough to say, with justice and the requisite foresight, who shall use how much gas for what. Experience and common sense tell me that such things should be determined in the market place, not the council chamber; by the free play of competitive forces, not by the fiat of any official but finite man or men.

The remedy lies rather, as I view it, in a proper price relationship, a price relationship such that coal, the plentiful fuel, will carry its proper share of the national fuel load.

The Price of Gas

WHAT factors, historically, have influenced the price of gas?

One chief factor has been that gas production, until recently, and even yet to some extent, has been the stepchild of the oil business, only half welcomed into the family. Lack of adequate market, and to some extent lack of prophetic vision as to its ultimate value, have led to its sale on a by-product basis. The result has been long-term contracts at low prices.

In areas reached by long-distance gas lines, that day is rapidly passing. The great known reserves of dry gas, not produced with oil, are pretty well dedicated to lines already existing or in immediate prospect. New lines, in the main, have to seek most of their gas from fields in which the gas is associated with oil or condensate. The oil companies have come alive to the value of such gas; they are not selling it for a song. In the Gulf Coast region where Tennessee, only three or four years ago, was blessed for paying five cents per Mcf, Texas Eastern and Memphis are cursed with trying to get contracts of decent length at six to eight cents. Natural gas companies are having to accustom themselves to paying higher prices for new supplies.

The other big factor affecting the price of gas to the consumer is rate regulation. The prices at which coal and oil are produced, processed, and marketed are determined by competition. In the whole sequence, from pit face or reservoir sand to the consumer's bin or tank, the only regulated factor is land transportation. Water transportation, an important factor, especially in oil, is not regulated. In contrast, both the interstate transportation and the distribution of natural gas are subject to rate regulaion. Thus, except as to certain forms of transportation, the price of coal or oil to the consumer is unregulated, and for all practical purposes is fixed by the law of supply and demand. The price of gas is regulated from the end of the gathering line to the burner.

Regulation

I am not decrying this regulation of the cost of gas to the consumer. Experience has proved that state regulation of public utility rates is both necessary and workable. The chance that the federal government will surrender control over interstate gas lines is too remote to discuss. The business of transporting and distributing natural gas gets paid for its subjection to rate regulation; it gets a measure of protection in the markets that it serves. Within certain limits and with certain exceptions, it gets monopoly in exchange for regulation. I do not argue against either the inevitability or the wisdom of the rate regulation to which the price of gas is now subjected.

What I do contend is that, unless gas is going to be called upon to carry an undue share of the fuel load, *there must be an area within which the law of supply and demand can operate, an ared where the price is fixed by competitive value and not by regulation.*

That area—the only remaining area—is in the producing field. It seems to me imperative, if we are not to use up our natural gas reserves while equivalent heat units of coal and oil go unused, that the production and gathering of gas, and the price paid therefor, be as free from regulation as the production and gathering and price of coal and oil; that competition, and competition alone, be allowed to determine the price of gas at the point of delivery for interstate shipment.

Still other forces are bearing upon the field price of gas. One of the most important is the increasing pressure for gas conservation by the state conservation commissions, and their recognition of price as the most potent conservation agent.

No one is likely to save, gather, and deliver gas for less than it costs him to save, gather, and deliver it. He is in business to make a profit, and if he fails to make a profit he will soon be out of business. Unless he can make a profit on selling his gas he will waste it. Few operators, on the other hand, will waste gas if they can sell it at a profit. A difference of half a cent per thousand cubic feet may determine whether gas is burned in a flare in Texas or in a gas furnace in Ohio.

The gas furnace and also the gas flare, moreover, have a competitor coming up: the plant for converting natural gas into liquid fuels. People who want natural gas for cooking or heating or industrial uses are going to have to pay a high enough price, within a few years, to keep the gas they want from becoming gasoline.

We must not forget, however, that competition is not a one-way street. Prices can travel it in either direction, and gas prices may not do all the traveling. When coal and coal cars are again in abundant supply, the coal industry is not likely to lie asleep under a lamp post while gas runs away with its markets. It will try, by one means or another, to keep what market it still has and to reclaim as much as possible of what it has lost.

Knowing the oil business, I can assure you that when heating oil is again plentiful, if that day ever comes again, gas men will have to fight for every customer they get or keep. The reason I do not say more about a competitive price relationship between oil and gas is a simple one; the day when heating oil will again be in abundant supply appears more remote and perhaps more problematical. Until that day comes the basic competition with gas must come from coal. It is coal, the fuel of which we have hundreds of years supply, that must, during the next few years at least, keep gas within its proper markets.

Now the only way that man has yet discovered to capture or keep a market, in a free-enterprise system, is to offer his product at a price that attracts buyers. Whether the coal industry reduces its costs per ton, or develops cheaper or more efficient—and cleaner and more convenient—methods of use, or finds ways to cut delivery costs, or however it does it, I shall be surprised if, when coal is once more in free supply, gas prices do all the adjusting toward a sound competitive balance.

The Important Thing

The important thing, however, if coal is not to lie in the ground unmined while gas carries more of the fuel load than it should, is not how much gas prices go up or how much coal prices come down, but that the two compete to a proper price relationship. We must be sure to keep an area within which the price of gas, like that of coal, is regulated solely by the law of supply and demand.

"Our primary job is to get back into house-heating business in a big way"

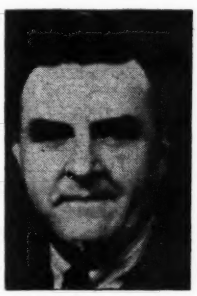
℞

Prescription for House-Heating Ills

By ROBERT E. GINNA

Vice President
Rochester (N. Y.) Gas and Electric Corp.

IN the latest report issued by the Househeating and Air Conditioning Committee of the American Gas Association, Bulletin No. 73, issued August 29, 1947, the following statement is made:



"Over a long period of years through excellent advertising promotion and salesmanship by the industry, gas heating now enjoys a high degree of *consumer acceptance.* In developing this consumer acceptance the gas industry was the leader in developing and maintaining high standards and thus building *consumer confidence.*"

Have we built consumer acceptance for gas house heating? I'll say we have! Thousands of prospective customers all over the country are clamoring at the doors of gas utilities demanding service, a situation largely brought about by the higher costs of coal, coke and oil. True, the competitive situation is not entirely responsible for the unheralded and unpredicted avalanche of business.

You and I also know that new home owners, who want the best in comforts for their families, recognize that no other fuel is as reliable, clean and fully automatic as gas. Yes, people have come to realize that when it comes to automatic heat, gas is in a class by itself. Like the Packard car slogan: *Ask the man who owns one.*

Can anything be more essential and basic than having such confidence for the future success of the gas industry?

Why my concern, you rightfully ask, about confidence? Well, let us see who it involves and how house heating affects confidence or is affected by it. First, there is the *consumers'* confidence; second, there is *investors'* confidence; and third—and equally important—is the *employees'* confidence.

It is the first group—the consumers—that I am particularly interested in, because as I see it, if we can satisfy our consumers we shall gain the confidence of the investment world, which will in turn provide the funds to assure the continued expansion of our facilities and thereby provide good jobs and futures for our employees. Yes, it is as simple as that to say it, but what a job it is!

Examine the vast number of articles and speeches on gas house heating in the trade and association papers of your industry during the past two years, the period of an unprecedented demand for our service to heat the homes of America, and you will find darn little recognition of what the consumer might or does think of us. And yet we talk of having *built* consumer confidence.

Let us forget for the moment the lack of capacity; the fact that we have plenty of natural gas but no compressors, no pipe, and no meters; the production problem, load factor and compensating loads, and all such problems which have taxed and worried us all to an extent without parallel in American business. Let us put ourselves in the shoes of Mr. Joe Smith, the customer whose confidence we must retain and, if you please, obtain too. For the moment he is tolerant of our inability to serve him and perhaps believes it is all part of the general economic situation; but how long is he going to wait while some of us endeavor to decide:

1. *Whether or not we shall get enough natural gas in time.*
2. *Whether or not to put in more water gas sets.*
3. *Whether or not to make high-Btu gas.*
4. *Whether or not to build more coke ovens.*
5. *Whether or not to increase distribution pressures.*
6. *Whether or not to sit out in hopes that someone else will find some new production method.*
7. *Whether or not to raise the house heating rate drastically to a prohibitive level so as to discourage the business altogether.*
8. *Whether or not atomic energy will come in time.*

The thousands of Joe Smiths who are waiting to enjoy the comforts of automatic heating with gas are not going to come forward to help the gas utilities solve their problem—they expect us to be able to run our own business, manage our own problems, and serve all comers according to our franchise obligation without discrimination. In this connection, I cannot help but wonder about Joe Smith's thoughts on the claim we often make about our private utilities being business-managed.

I particularly wonder how he feels about our sitting on our hands, as signified by our being unwilling to fully support research and the other beneficial activities of the industry—whether through individual company enterprise or through our trade and related associations. Need I tell you what Joe Smith and his wife are thinking and—worse yet—saying about us?

I recently agreed with the sentiment expressed by Chairman Milo R. Maltbie, of the New York State Public Service Commission, relating to the gas house heating situation. At a recent informal conference of public utility representatives called to consider the matter, he pointed out that we—the utilities—were sadly mistaken if we thought the commission was going to reverse the state's whole legislative policy involving service to our customers by blandly establishing permanent house heating restrictions.

Before leaving with you my prescription for curing the house heating situation, permit me to talk a bit about "employee confidence," for I know that you well know the investor's angle. Many of us, in choosing jobs in the utility field, naturally considered:

(1) the expansion and growth records of utilities in their efforts to keep abreast of changes in public demand, (2) the ability of utilities to withstand changing economic conditions, and (3) whether a utility was anchored in the community and was an essential and vital part of it.

The time has come for all of us to keep the tradition alive and to pass it along to our successors. But a basic ingredient is missing, and that can be expressed in one word—*research*. Yes, it is as simple as that—particularly when expanded into production research, market research, consumer research, and the many other facets of this gleaming and promising gem.

To be sure, the present AGA research program is admirable and a tremendous step forward but I assure you it just begins to scratch the surface and therefore it is most inadequate. Think of it, only about $900,000 for a $5 billion industry. Yes, less than $1 million to cure such headaches as the problem of taking care of all the Joe Smiths and their grandchildren-to-come! Why, the million dollars isn't even "peanuts!"

I know how distasteful comparisons can be, especially electrical ones, *but* . . . Many of you have heard of the electric heat pump and what the electric utilities are doing about it. Let me quote from a report just published by the Edison Electric Institute, as follows:

"Through the use of year-round air conditioning made possible by the electric heat pump, the possibility of an increase in residential use of electricity in many households to an amount equal to over seven times the present average annual domestic consumption is implied in a report published by the Indoor Climate Committee."

The electric industry is now spending $1 million on electric heat pump research installations alone.

Right now the manufactured gas utilities are up against the high cost of coal. Just suppose the coal mining industry had devoted appreciable funds 20 years ago to more improved and widespread use of mechanical methods of mining, might we not now be receiving coal at a lower cost? Let the gas industry take a leaf from that book and look ahead 20 or 30 years when perhaps we shall be out of natural gas. What then? Shall we say to the Joe Smiths—sorry, but we can't afford to serve you gas at all for heating? Or what shall we do in 18 years when oil runs out?

Recently I had the privilege of being a guest on General Motors' "Train of Tomorrow." Naturally the question in my mind was: Is General Motors going into the railroad car business? The answer was an emphatic *no!* It is a research project to help General Motors sell its goods through our having good transportation. This is just one illustration of how enterprising and surviving American industries lead the world in accomplishment.

Time and again the statement is made by our business leaders that the problem of management is to produce more goods and services for satisfying peoples' wants at prices more people can afford to pay. I agree with this and further appreciate that it is not a job for just a few men in big companies. It is up to all of us who are responsible for operating any size or kind of business, for in our democratic economy all businesses add to the overall economy.

Maybe I'd better ask then, "What time is it?" For the gas industry is it getting late? Or is there still time to open the doors wide and let in all the waiting Joe Smiths and another generation of employees to serve them? Whatever needs to be done to get us over the immediate hurdle should and must be done if we are to obtain and retain consumer confidence.

The Prescription

Now for my prescription and the answer to the question in everyone's mind, "What To Do About House Heating."

Obviously, our primary job is to get back in the house heating business in a big way and if we need adventurous men of vision to do it, let us get them before it is too late.

Almost every periodical that crosses my desk these days highlights either the preservation of free enterprise or the importance of public and employee relations. In this job of fighting to keep our economy of free enterprise, the gas industry must obviously do its share. Our economists do not always agree on many questions, but I do not find any disagreement with the premise that if we are to maintain full employment, the level of production must be kept high. This does not mean just industrials, it means every type of business, large or small and especially utilities—gas and electric. This means, over the next five years, plant expansions in a big way. This will require personnel of specialized training. Where will it come from? From our own ranks or outside the industry? Will we attract talent to our industry if the GI's now completing their education get it in their heads that the gas industry does not wish to grow—that its managements cannot solve their problems—that investments in new plants are too risky?

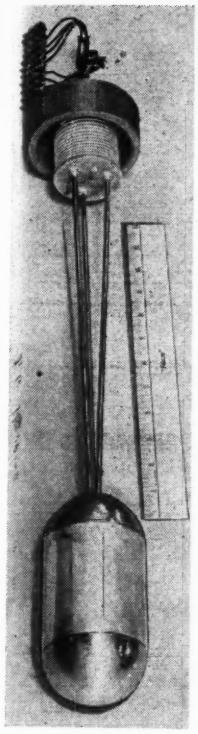
We talk about employee relations and better education of employees in the ways of business. But let's go farther than that. Let's also inspire them to the realization that our business has great promise of a future for each one of them. Let us prove it by action and they will be more likely to read our booklets and exhortations, and thus take more interest. Don't you think it is embarrassing to our salesmen to say: "Sorry, we got plenty of nuthin'!" Any good sales manager will tell you that that song is demoralizing on a sales crew, and what is more it sours the whole organization.

Certainly these statements do not apply to all managements. There are of course enlightened utility managements today spending a lot of money, time and gray matter on retaining their markets and building plants to supply growing new and expanding markets. If your company has such a management, congratulations. You need not fear the future.

Now, let me summarize briefly some further points for your consideration in tackling the house heating problem.

1. *You cannot go on telling customers about shortages. The state commission is liable to take action.*
2. *You need to initiate and support research.*
3. *If the house heating load is of such magnitude that you cannot take care of it, restrictions might better be by rates, not by edict.*
4. *Now is the time to consider rate increases—so one does not build up a load that will drop off at first business recession.*
5. *You may be able to increase the capacity of your distribution system and equipment by increasing thermal value within interchangeability limits.*
6. *Your customers, during restrictions, should be told frequently about efforts to make house heating available to them.*
7. *Maybe we can learn some tricks about serving large house heating concentrations by studying properties having large saturations of it.*
8. *You may, without question, have to abandon 18-carat (free) servicing policy and start charging for everything.*
9. *Encourage people to use storm windows, weather stripping, etc. —to keep demand down and hang on to load.*
10. *Anticipate needs for equipment far in advance. You cannot work on a hand-to-mouth basis.*

Presented before New Jersey Gas Association, Trenton, Sept. 23.



View of the detecting element of the flow meter designed by Consolidated Edison engineers, showing the aluminum vane which extends into the gas stream, and the flexible metal bellows which houses the electrical elements.

Invention of Consolidated Edison engineers facilitates flow condition studies

GAS FLOW METER

ENGINEERS of Consolidated Edison Co. of New York Inc., have devised a new type of gas flow meter. Still in the experimental stage, the device is intended to facilitate flow condition studies.

The new meter is based on a unique principle and employs electricity to record deviations in gas flow. Changes in flow are transferred mechanically to electrical strain-gauges, hair-like alloy wires which vary their resistance to an electric current as they are extended or compressed.

Manufactured by the Baldwin Southwark Division of the Baldwin Locomotive Works, electrical strain-gauges have been used in stress measurements by mechanical engineers for some time and were employed in wind tunnel tests during the war to record strains on flying elements of airplane models. The gauges consist of copper-nickel wire, .001 in. in diameter, wound into a grid pattern on a piece of reinforced paper and covered with a protective strip of felt.

In the flow meter devised by Consolidate Edison's Test Bureau, four of these electrical strain-gauges are mounted on a 3-in. piece of spring steel. The electrical elements are tied into a Wheatstone bridge. One end of the steel strip is firmly anchored to the wall of the gas main while the other end supports a steel tripod extending into the gas stream. At the end of the extension is a hollow cylinder of aluminum, 3 in. in length and 3 in. in diameter, closed at either end with a hemispherical cap. The form of a capped cylinder was used because its streamlined shape reduces any vibration that might be caused by changes in the flow of gas. With its hemispherical caps, the cylinder presents a nearly identical cross-section to the gas stream regardless of its deflection.

When gas flow in the main under observation varies, the degree of deflection of the hollow cylinder changes. As the assembly, with the exception of the spring steel, is rigid, the entire motion is transferred to the spring to which the strain gauges are attached. As tension increases the normal resistance of 120 ohms in each element, and compression reduces the normal resistance, the motion of the cylinder in the gas stream is transferred into varying electric currents.

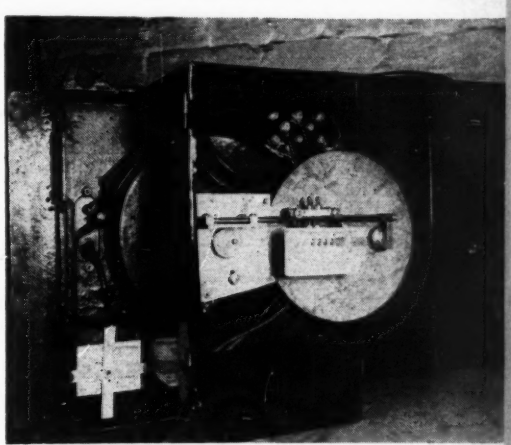
Electrical variations cause a sensitive recorder galvanometer to deflect. This in turn automatically controls a slide wire resistor contained in the recorder and restores balance to the galvanometer. A pen, mechanically attached to the slide wire, indicates the change on a moving chart.

The strain produced in the copper-nickel elements at any given time due to gas flow is proportional to pressure on the hollow cylinder in the gas stream. The pressure on the cylinder is related to the square of the velocity of the gas stream. The recorder is equipped with a specially calibrated balancing circuit so that the instrument will respond in linear fashion to changes in velocity.

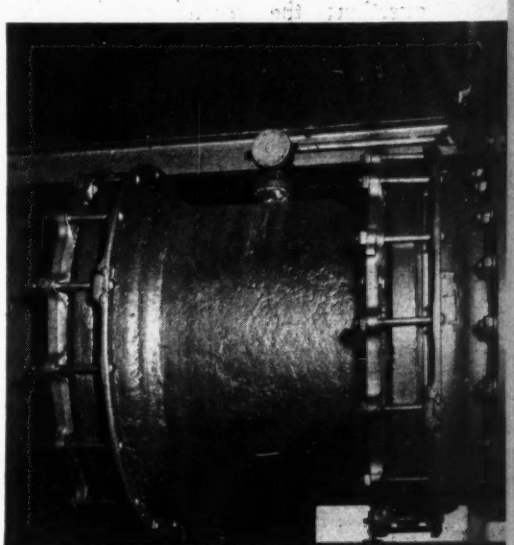
Since the amount of gas passing through a given section of main in a fixed amount of time is dependent not only on the velocity of the stream but also on the pressure of the gas in the main, the recorder is modified with a variable shunt resistance so that its measurements include changes in volume occasioned by variations in the static pressure of the gas being measured.

All electrical components of the flow meter are sealed in a flexible metal bellows so that there is no possibility of their coming in contact with the gas stream. The entire device is designed so it may be inserted in gas mains through a tapped hole.

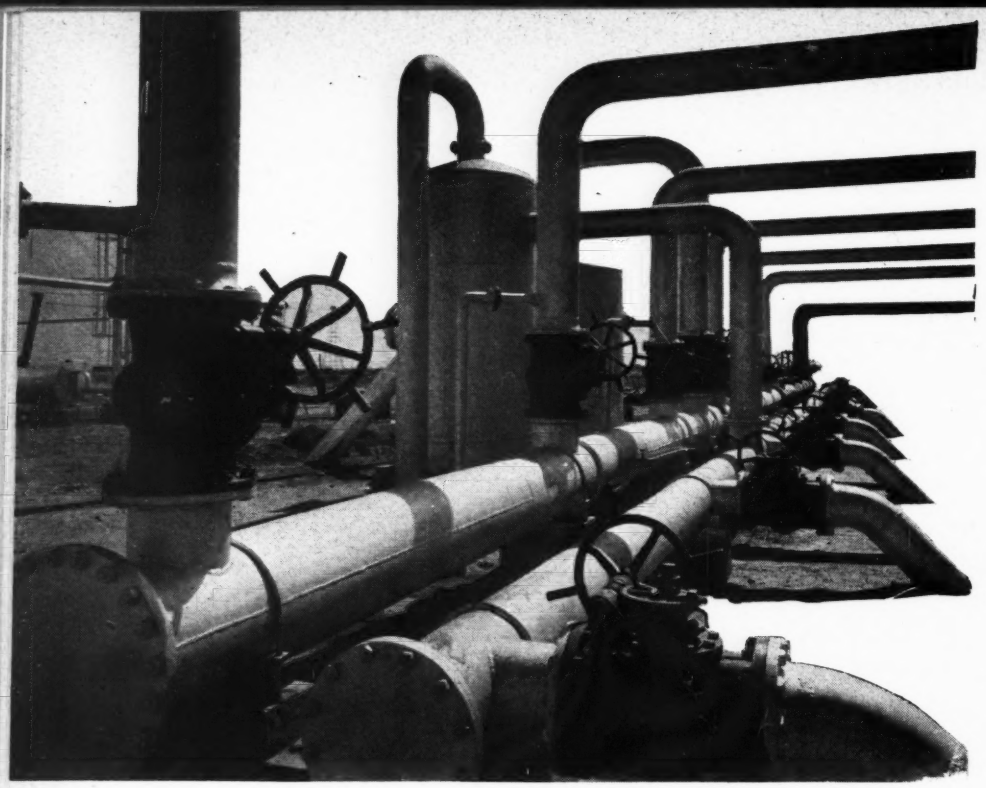
According to Consolidated Edison engineers, the instrument, still in experimental form, eliminates the installation difficulties found in other types of gas flow meters and is sensitive enough to record changes in low-pressure gas flow.



Mechanically attached to the flow meter is an integrator which registers the total cubic feet of gas flowing through the main.



Gas flow detector assembly shown in place, installed in a gas main. Electrical wires are in pipe shown connected to detector mounting.



The set of valves performing in the above illustration is operating on exceptionally sour gas at the natural gasoline plant of the Barnsdall Oil Co., Ector county, Texas. These lubricated valves are of 10-in. and 12-in. size.

Valve

By GEORGE F. SCHERER

Director of Research
Nordstrom Valve Div., Rockwell Mfg. Co.

BECAUSE the lubricated plug cock is a comparative newcomer in the valve field, even after some 30 years of rapid development, the subject of valve lubricants and their application to the valves is not as well understood as it might be. To many users the principal consideration is that of obtaining a valve of requisite size and strength; the valve lubricant is largely taken for granted. Actually, the primary consideration should be the availability of a satisfactory lubricant for the service in question; the second consideration would be selection of the type and size to meet the service conditions, which is comparatively easy.

Exclusive

Misconception

A part of this failure to give adequate consideration to the lubricant results from the misconception as to the functions and capabilities of the so-called "lubricant," which is an integral part of the lubricated valve structure. Unfortunately, the appelation "valve lubricant" is somewhat of a misnomer, and does not adequately indicate the part this plays in the efficient functioning of such a valve; more properly such valves should be called "plastic sealed valves" and the "lubricant" could better be designated "plastic sealing material."

The introduction of this type of valve approximately 30 years ago brought to the valve field a new conception of pipe line control. In other types of valves then available, the ultimate valve closure was effected either by mechanical distortion of the metal seats or by the use of some type of fibrous packing material. The introduction of a plastic sealing material between two closely adjacent metal closure surfaces, which limits the rate of flow to a negligible amount, and the providing of means for renewal of this material when necessary, opened up new structural possibilities in positively sealed valves for controlling the flow of fluids in pipe lines, not only when the valve was newly installed but after long periods of service. This is made possible by renewing this seal and providing easy operation and tight closure merely by the injection of plastic sealing compound between the valve seats.

A little reflection will make clear the fact that, in contrast with an ordinary lubricant used to lubricate a rotating shaft in a bearing, the lubricant used in a lubricated valve is subject to the destructive action of the line fluid as regards its solvent power and washing action, and, very frequently in industrial service, the effect of elevated temperature—or, for that matter, of sub-zero temperatures. Hence, in addition to providing the desired properties of viscosity, wetting power, and thermal resistance, the valve lubricant must maintain these properties to a reasonable degree in the presence of the line fluid. Moreover, since the volume of line fluid passing through the valve may be several million times the volume of lubricant in the valve, it will be obvious that the lubricant must take quite a beating if the line fluid possesses high solvent power or has an appreciable chemical reactivity.

Fortunately, not all valve services combine to a large degree all the conditions pointed out above, and by the judicious selection of basically different types of lubricant, it is possible to cover a very wide range of conditions with a reasonable number of lubricants. The number of services which cannot be handled for lack of a suitable lubricant is being constantly narrowed or reduced with the development of new ones.

Lubricating Property Secondary

Since the lubricated plug cock is operated at a very low velocity of rotation, the required lubricating properties of the valve lubricants are rather easily attained and attention can be focused on the other required characteristics. So long as a satisfactory film of the sealing plastic can be maintained on the bearing surfaces of the plug cock, the metal surfaces are protected and easy operation may be secured without special regard to the oiliness or friction-reducing properties of the lubricant. This varies, of course, with the particular service and size of valves concerned.

It was pointed out above that the true valve lubricant is essentially a plastic material, and as such, by the definition of a plastic, is subject to flow under pressure. This rate of flow is a function, not only of the internal viscosity of the lubricant and the pressure to which it is subjected, but also of the characteristics of the aperture through which it flows under the laws of viscous flow. Moreover, when used in the modern type of lubricated tapered plug cock, the aperture between the closure surfaces permits only an extremely thin film of lubricant, which results in an extremely small cross-sectional area of flow. Evidently, the boundary layers of the lubricant film also resist displacement as a function of the wetting characteristics of the lubricant, so that this is a

ve Lubricants

The theory of the functioning of valve lubricants and bases to be used in selecting the proper one are discussed by the author

property of considerable importance in the lubricant. Therefore, in a well-made plug cock, which offers means for adequately disposing a lubricant film on the metal closure surfaces, the rate of displacement or flow due to line pressure is extremely low, and this seal will be maintained over a long period of time provided the lubricant is also resistant to solubility or dissolution by the fluid or temperature.

It also follows that the structural design of the valve must provide means for permitting rapid flow of the lubricant whenever it is desired to renew the sealing film. The more efficient types of lubricated plug valves on the market are so designed that, by one or another means at the command of the operator, a volumetric displacement of lubricant is secured by distributing at will fresh supplies of high viscosity lubricant over the sealing areas of the plug and body seats, and then automatically restricting the flow to the movement of a very thin viscous film between two closely adjacent confining metal walls. The rate at which this film is displaced by internal line pressure then becomes practically negligible, and the only further requirements which have to be fulfilled are that the viscosity be maintained and that the film be not disintegrated by the solvent power or chemical attack of the line fluid. Under such conditions, the replacement or renewal of the sealing film is necessitated only at infrequent intervals.

Cup Greases Unsuitable

Once the true functions of a valve lubricant and the limitations imposed on it under service conditions are understood, it becomes apparent that the ordinary types of cup grease are not likely to be suitable as valve lubricants or sealing plastics except under a very limited range of conditions. Likewise, plastic materials made expressly for valve lubrication cannot be used indiscriminately as lubricants in other mechanisms where some sort of plastic seal is also desired. For instance, a satisfactory valve lubricant which is highly stable in the presence of gasoline or light hydrocarbons and which possesses a satisfactory viscosity over a wide temperature range may not be at all suitable for packing a high speed centrifugal pump handling such line fluids, because of its lack of high lubricating characteristics.

The design or selection of a valve lubricant for a particular class of service should take account of the circumstances listed in *Table 1*.

Obviously not all of the above conditions can be met with a single lubricant, nor is it likely that all available types of lubricant will perform with equal efficiency. Generally a compromise must be made with a view to securing the best over-all service. In some instances it may be desirable to limit the number of lubricants used in the interests of simplifying the whole problem. In other cases the conditions to be met are relatively simple and the services localized so that good service can be obtained with one type of lubricant. Each manufacturer of lubricated valves has available literature describing the types of valve lubricant recommended for the various services most frequently encountered, and will also advise on any special conditions that may arise on new services that have not previously been handled.

Classifications

Lubricant services may be grouped into several general types and subtypes as shown in *Table 2*, with, of course, the proviso that there are always modifying conditions which limit the usefulness of any specific lubricant.

It will be noted from the outline that it is extremely difficult to avoid overlapping in the attempt to classify lubricant services. The best guide in selecting the most efficient lubricants is to avail oneself of the experience gained by the manufacturers of lubricated valves in years of attention to this highly specialized field of valve lubrication. But the other word of caution may be added: It is extremely important that the efficiency of a valve lubricant be not judged on the basis of a short test or upon undue emphasis of some particular quality conferred by the lubricant used, like extremely easy valve operation. Occasionally valve lubricants are selected after a short test which seems to provide very satisfactory performance from the standpoint of ease of operation or handling, but often such lubricants will eventually break down and leave a hard impenetrable mass in the valve due to partial dissolution of its components or by a breakdown as a result of evaporation of certain constituents, or of insufficient thermal resistance. It is preferable to use a lubricant which is gradually but uniformly removed from the valve in its entirety so that replacement with fresh lubricant can be made from time to time. Not all service conditions can be handled successfully with lubricated valves, but where satisfactory lubricants are available the plastic sealed lubricated valve offers much in the way of efficient valve service.

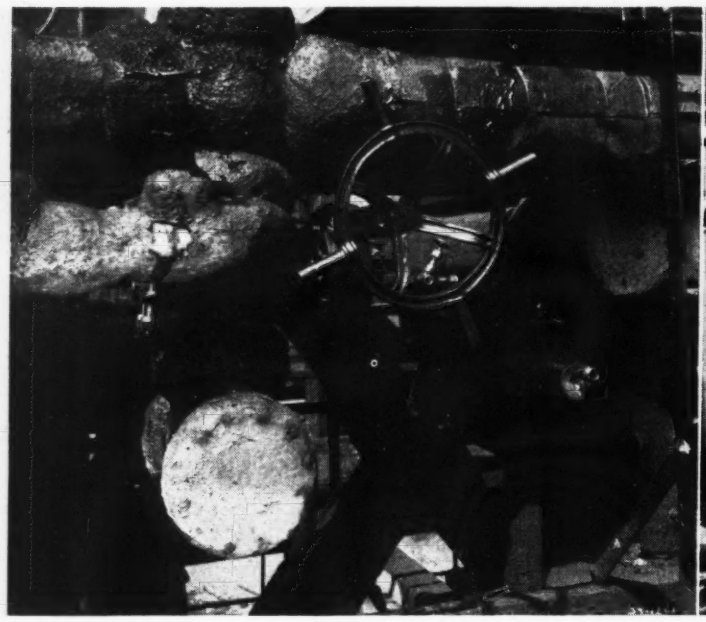
Gas Use Requirements

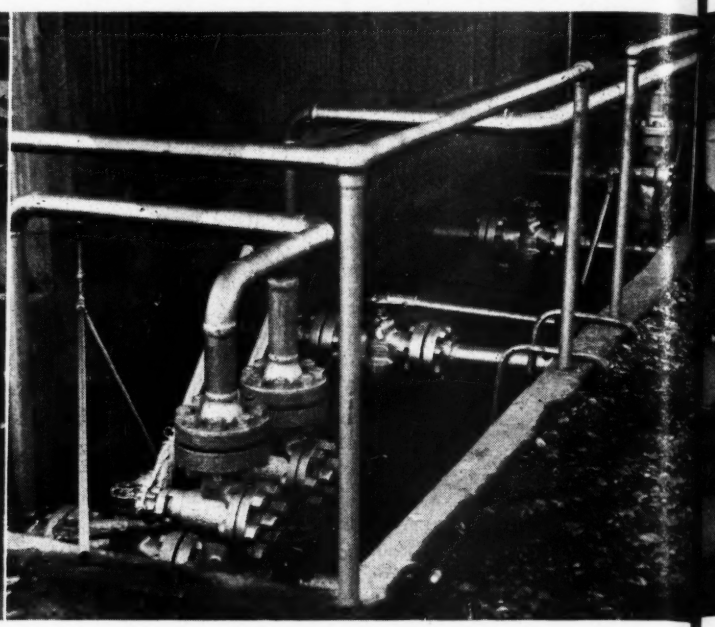
Taking as an example a type of service such as the gathering, trans-

TABLE 1. CRITERIA

1. Nature of the line fluid
   a. Solvent properties
   b. Chemical reactivity
   c. Liquid or gas or condensing vapor
   d. Corrosiveness to valve metals
   e. Self-lubricating qualities
   f. Single or multi-phase components
   g. Septic or toxic
   h. Contaminated or not by lubricant
2. Temperature
   a. Of line fluid
   b. Climatic temperature range
   c. Fluctuating or constant
   d. Insulated or non-insulated valve
3. Size of valve
4. Frequency of operation
   a. Emergency stop valve
   b. Control valve
   c. Intermediate frequency of operation
5. Pressure
   a. Positive pressure
   b. Vacuum service
6. Type of Valve
   a. Tapered seat
   b. Cylindrical plug
   c. Balanced plug with non-integral stem
7. Type of lubrication desired
   a. Lubricant sticks
   b. High-pressure grease gun
   c. Air-actuated high pressure remote feed systems
8. Ambient conditions
   a. Excessive humidity
   b. Excessive dryness
   c. Exposed or remote locations

VARYING DEMANDS ARE MADE UPON VALVE LUBRICA





Valve lubricants must function under varied conditions of temperature, pressure, location, types of gas, etc. These illustrations show Nordstrom valves in action on four types of installations. From left to right, above, the first picture is of a high-temperature hyperseal valve operating at a temperature of 950°F. on a cracking unit. The second set of valves rep-

mission and distribution of natural gas, we find the valve lubricant problem requires a consideration of the following general factors:

The great bulk of the valves used will be handling a comparatively dry hydrocarbon gas of negligible solvent power at a temperature determined largely by climatic conditions. Except at the compressor stations, the maximum temperature of the gas will not be over 150°F and, except at points where a very rapid expansion takes place, the minimum temperature will be determined by the ambient temperature present and the degree of exposure of the pipe line. The gas in exposed sections of the line such as at bridge crossings, at meter stations, or even where submerged in water, may reach temperatures of whatever the ambient temperature may be, but if the gas is flowing at a normal rate, the time of exposure is not long enough to reduce the gas temperature much below the ground temperatures and probably a minimum of minus 20°F even in Northern latitudes. The valve lubricant should maintain a satisfactory viscosity over this temperature range.

As the pressure drops between compressor stations, the expansion of the gas will exert a drying action on the lubricant in the successive valves through which it passes, so that the lubricant should be able to withstand this drying action or, in other words, should contain no materials of high vapor pressure.

Many of the valves used in this service are of very large size and, this fact coupled with the high line pressures, necessitates a lubricant of maximum lubricating properties as well as good sealing properties. Since these valves are essentially stop valves used for emergency, or at least subject to comparatively infrequent operation, the lubricant should possess good aging qualities and be neutral in contact with the iron or steel valve structural parts. Lubricants which adequately fulfill these requirements are readily available.

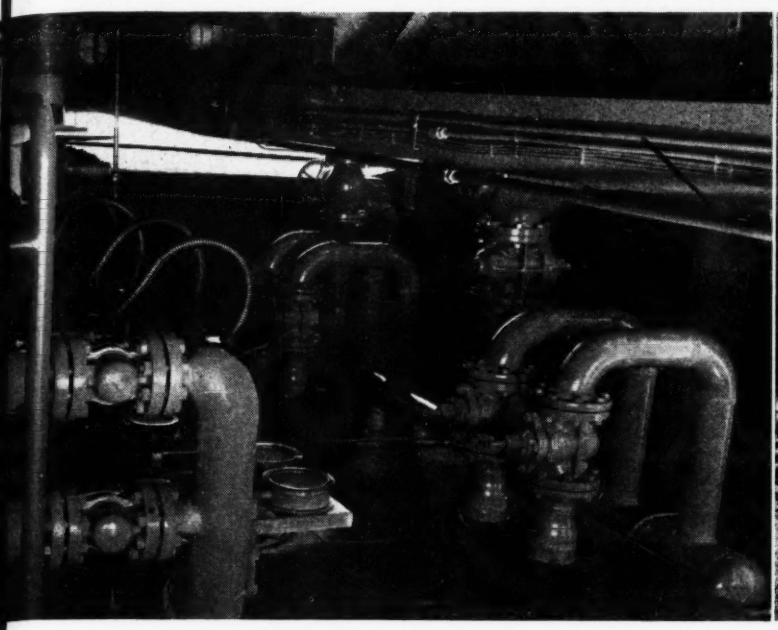
Temperature Consideration

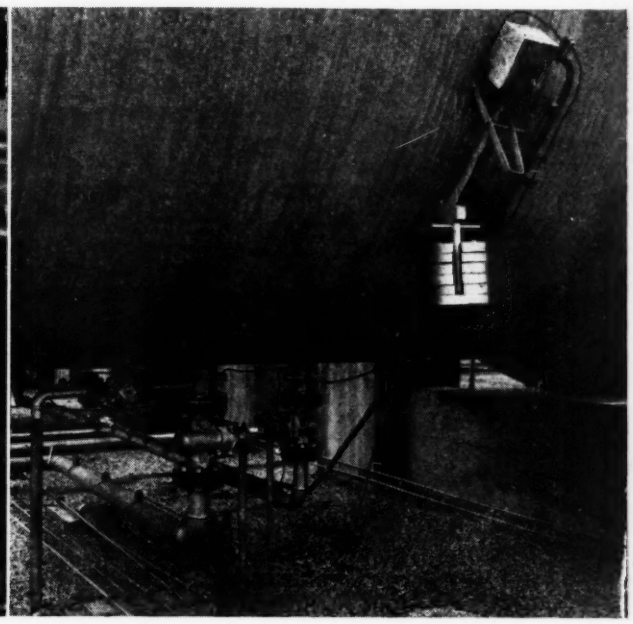
Some of the valves located on compressor station discharge lines are subject to considerably higher tempera-

CLASSIFICATION OF TYPES L

1. Lubricants for highly reactive chemicals
   - a. Mineral acids
   - b. Mineral alkalies
   - c. Aqueous solutions of acids, alkalies and salts
   - d. Chemical agents such as chlorine, fused salts, ammonia, phenol, etc.
   - e. Organic compounds (not solvents) for mineral hydrocarbon waxes and oils
2. Lubricants for organic solvents
   - a. Light petroleum hydrocarbons such as gasoline, kerosene, etc.
   - b. Mineral oils, lubricating oils
   - c. Aromatic hydrocarbon solvents such as benzol, toluol, etc.
   - d. Chlorinated hydrocarbons—carbons—carbon tetrachloride, trichloroethylene, etc.
   - e. Ether, acetone, ketones, etc.
   - f. Synthetic lacquer solvents
3. Lubricants for mixed oily and aqueous materials
   - a. Mixtures of petroleum hydrocarbons and acids, alkalies, and water
   - b. Drilling mud with crude oil
   - c. Combination of aqueous and organic condensates in natural and manufactured gas lines
4. Lubricants for extremely high temperature service
   - c. Catalytic cracking of petroleum
   - b. Molten fused salts and metals
   - c. Hydrocarbon vapors
   - d. Air
5. Lubricants for extreme low temperatures
   - a. Dewaxing of lube oils
   - b. Brine refrigerants
   - c. Synthetic processes such as manufacture of tetra-ethyl lead, polymerization of butenes, synthetic rubbers, etc.
   - d. Wind tunnels for aircraft testing

THESE FOUR APPLICATIONS OF NORDSTROM VALVES





resented are Merco-Nordstroms functioning on transfer lines in a cycling plant. Third shows valves being used on gas and oil lines at a steam plant, and the fourth above demonstrates the use of a Nordstrom valve with electrical safety trip set on the bottom of a butane storage tank at a standby plant. All of these installations are lubricated with appropriate insulating elements.

tures, in some cases reaching 325°F. Also, at certain locations a considerable amount of gas condensate may be present. These conditions necessitate a different type of lubricant for such valves, and the problem is more difficult. However, specific lubricants are also available for this service.

At certain locations where drip pots are installed, the valves are of small size and the valve lubricant will have to withstand the solvent action of both organic and aqueous condensates, in which case the proper type of lubricant should be applied as recommended by the manufacturer.

Service cocks and meter cocks are of small size and, being generally made of a combination of brass and iron parts and subject to very infrequent operation, require a lubricant which has good aging properties and will not corrode these parts.

Auxiliary Services

Auxiliary services such as the equipment for injecting odorants into natural gas require a lubricant which is not disintegrated by the carrier fluid in which the mercaptans are dissolved, and is not affected by the chemical activity of the mercaptans. The valves are of comparatively small size but in some cases subjected to the full line pressure. These conditions dictate a valve lubricant of essentially the chemical resistant type which is also insoluble in hydrocarbon solvents.

For butane-propane type gas plants a number of the valves will be subject to the high solvent effects of the liquid hydrocarbons and this factor will assume primary importance. However, valve lubricants are available which are totally resistant to such solvents and, in addition, include proper viscosity characteristics to provide an adequate seal against leakage.

In each service the problem reduces itself to using the lubricant best suited to the particular service requirements. The best guide to follow is the valve manufacturer's recommendations, which are based upon specialized experience with the valves and lubricants.

The efficiency of a lubricated valve is directly proportional to the efficiency of its lubricant.

LVE LUBRICANT SERVICES

6. Lubricants for extremely high vacuum service
   - a. Penicillin
   - b. Blood Plasma
   - c. Nuclear fission products
   - d. Tobacco conditioning
   - e. Purification of pharmaceutical products
7. Food products; unaffected taste, odor or color; textiles, fine chemicals
   - a. Vegetable oils and waxes
   - b. Distillation of beverage alcohol
   - c. Textiles—synthetic and natural
   - d. Plastics and photographic products
8. High pressure gas and oil lines
   - a. Natural and manufactured gas transmission lines
   - b. Refined products transmission lines
   - c. Gas recycling plants
   - d. Gas distribution systems
   - e. LPG distribution lines
9. Water and sewage purification
   - a. Treating plants
   - b. Distribution lines
10. Steam
    - a. Boiler blow-down valves
    - b. Steam traps and feed water heaters
    - c. Water treaters
11. Miscellaneous
    - a. Wet cement and clay slurries
    - b. By-product coke ovens
    - c. Submarine loading terminals for petroleum products
    - d. Air field fuel lines
    - e. Marine service
    - f. Mine waters—corrosive

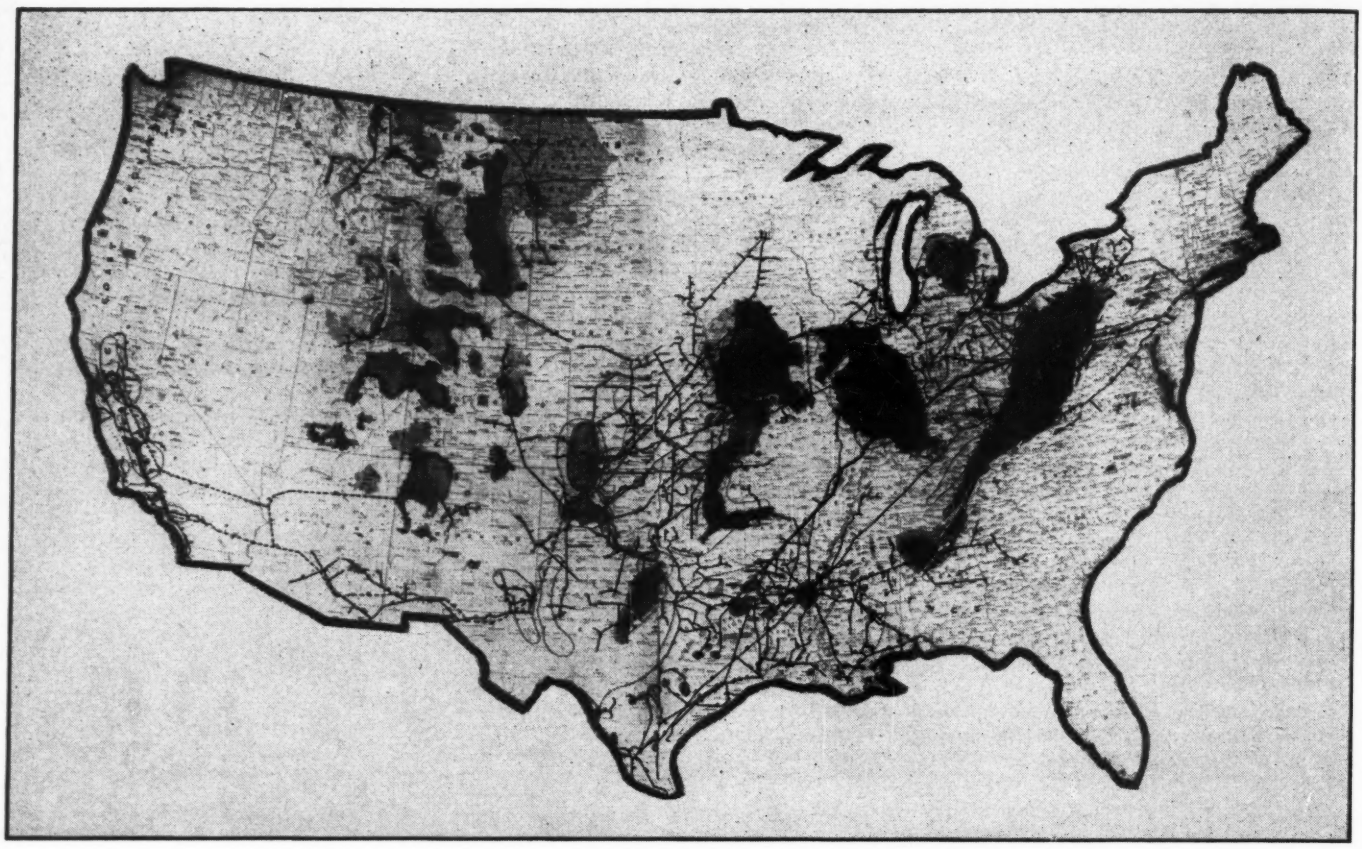


Fig. 1. Natural gas pipe lines servicing all centers of population in the United States pass over most of the nation's coal mining fields, shown by the shadowed outlines on this map.

Gas Lines—Coal Carriers of the Future

By PAUL KAYSER

President, El Paso Natural Gas Co.

IT is apparent that the entire United States from north to south and east to west is being gridironed with a network of natural gas lines extending to all centers of population throughout the entire nation. When we complete the Texas-California line, for the first time in the history of the country, there will truly exist a transcontinental pipe line of large diameter stretching across the continent from east to west.

Indicating that pipe line growth is proceeding at an exceedingly rapid rate, in the fiscal year ending June 30, 1947, the Federal Power Commission authorized the construction of $273,196,302 of new facilities designed to deliver in excess of 2000 MMcf of gas per day to 80 large cities in 23 different states. This was more than double the amount authorized for the fiscal year ended June 30, 1946.

As you can note from the map, shown in *Fig. 1*, the eastern terminus of our line in West Texas is only a short distance from the western terminus of the Panhandle Eastern Pipe Line Co. serving Detroit, and with connections to the Atlantic seaboard, the 24-in. and 26-in. pipe lines of the Natural Gas Pipe Line Co. of America serving Chicago, and Northern Natural Gas Co.'s line serving Omaha, Minneapolis and St. Paul. Interconnection with one of these lines will probably be built in the near future.

Likewise, there is currently proposed a line from the sources of supply in South Texas to cross these many lines leading from the West Texas and Hugoton fields for the purpose of making the reserves of South Texas available to the markets served by these lines. It can truly be said then, that there is now constructed or in course of construction a complete system of natural gas pipe lines—so complete that all sources of supply will soon be connected or interconnected with all markets so that the gas may be made available to all markets as their needs may require, or to any particular area in time of national emergency.

Presented at Pacific Coast Gas Association annual convention, Coronado, Calif., Sept. 24.

The significance of these large diameter pipe lines can be clearly shown by comparing the work they do in a day with the work done by large electric lines and by the railroads.

When the Texas-California line is completed to its full capacity of 305 MMcf per day, it will deliver to this state each day on the average approximately five times as much energy as the Metropolitan Water District's Boulder Dam electric lines. Converted to oil at the rate of 6 Mcf of gas as the equivalent of a barrel of oil, it brings in approximately 51,000 bbls. of fuel oil or approximately 200 tank cars a day—three train loads each day. Converted into coal at 25 Mcf per ton, it brings in the equivalent of approximately 12,000 tons or 240 carloads of coal per day.

This vast rapid expansion has been and is being criticized from some sources on the ground that we are plunging into the exploitation of an exhaustible and irreplaceable natural resource; that these additions to our economic life are not permanent, and that this excessively rapid development is causing dislocation of our economy.

The whole point to my talk is to demonstrate to you that the exact opposite is the truth.

Recently, P. C. Keith, president of Hydrocarbon Research Inc., and one of the foremost engineers on hydrocarbon research in the United States, delivered an address before the Princeton Bicentennial Conference — Engineering and Human Affairs—on the subject, "Progress in the Transformation of Energy." After reviewing the history and giving the present status of the development respecting the making of motor fuel from natural gas and coal, Mr. Keith said:

"Concurrent with advances made in the synthesis of oil from coal and gas, there have been extremely important advances made in the conversion of coal into gas. The Lurgi Co. of Germany in 1936 placed into operation at Zittau their first high pressure coal gasification plant to produce directly from coal, i.e., without using any oil gas for enrichment, a gas suitable for town use.

"The process is simplicity itself. By means of a lock-hopper system, brown coal is fed semi-continuously into the top of an open chambered vessel, suitably insulated. And maintained at a pressure of about 300 psi. Into the bottom of the vessel is fed a mixture of steam and oxygen. By incomplete combustion the coal is gasified, some oil being recovered as a by-product and the ash being withdrawn semi-continuously from the bottom.

"Technically, the process has been a great success. The Zittau gas has a calorific value of about 470 Btu per cu. ft. when freed of carbon dioxide. Recently at Most, Czechoslovakia, I had the privilege of inspecting in detail the last Lurgi installation built. Gasifying brown coal sized from 4 to 10 mm., they were producing a finished town gas having a calorific value of 570 Btu per cu. ft. Had the oil distilled from the coal been returned to the generator for cracking, the calorific value of the gas made would have been in excess of 600 Btu per cu. ft. The efficiency of the gasification step was in excess of 80% (heating value of products divided by heating value of coal).

"This installation was supplying gas at 300 psi pressure to a 120-mile gas distribution system. A pipe line from Prague to Most is under construction which will add another 70 miles to the distribution system. Presently, the Lurgi generation plant is being doubled. With the removal of some obvious bottlenecks, this installation could produce 15 MMcf of town gas per day directly from low-grade coal and with a thermal efficiency of 80% plus.

"As American engineering has improved and cheapened the synthetic oil processes, so can it materially improve and cheapen the coal gasification process. Whereas the present Lurgi process utilizes a highly reactive, non-caking brown coal, there is no fundamental or basic reason why a highly-caking, relatively inactive bituminous coal cannot be gasified to yield a gas of 900 to 950 Btu per cu. ft. and with a thermal efficiency of 80% plus. Development work to achieve this is already under way."

The Pittsburgh Consolidation Coal Co. has announced plans and is now actively engaged in the construction of a pilot plant to make high-Btu gas from coal. I talked to Mr. Joseph Pursglove, vice president, who has this development directly in charge, and he states that his company is proceeding with the construction of this plant as rapidly as material shortages will permit. He is thoroughly confident of its ultimate success.

But the success of the transformation of coal to gas as a commercial

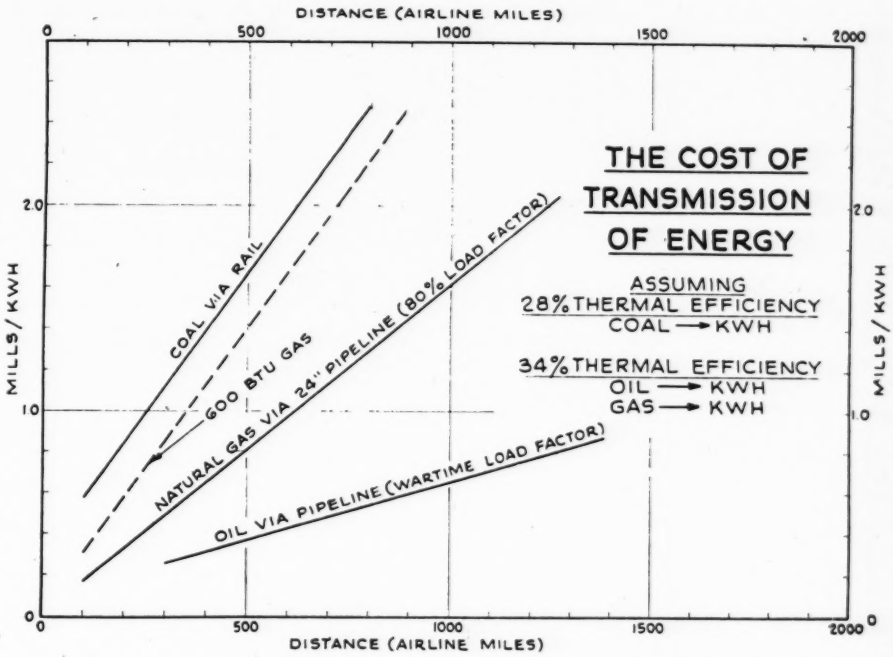


Fig. 2. This chart shows that 600-Btu gas, made from coal and transported by pipe line, has a lower transportation cost than coal shipped by railroad.

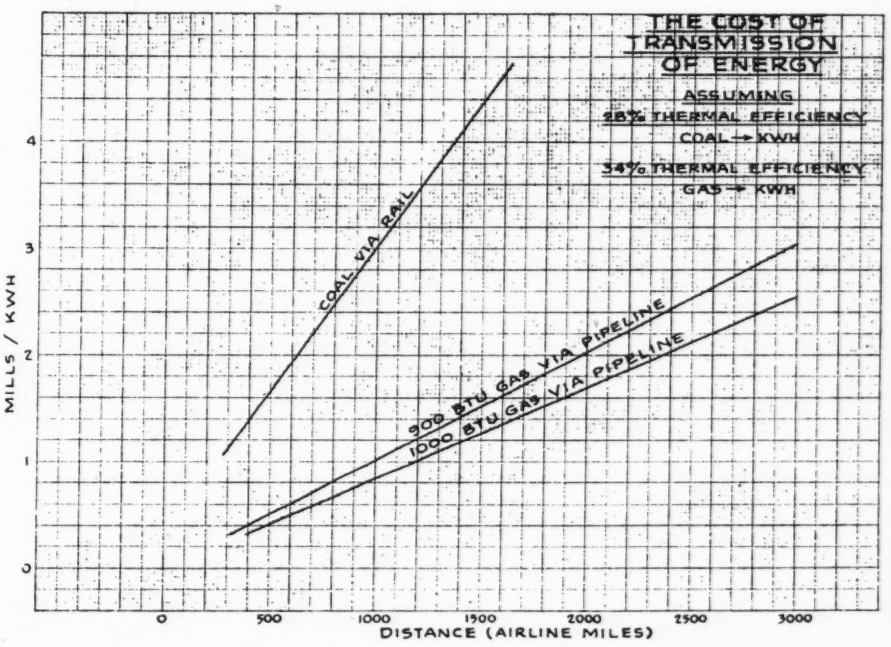


Fig. 3. Using figures for gas transportation cost applicable under the rate in effect on the Texas-California line, the relative cost of transporting the kw hour from coal, from 1000-Btu natural gas, and from 900-Btu gas made from coal is shown.

means of using coal to produce useful energy is necessarily bound up in the question of the relative cost of the transportation of gas against the transportation of coal. Mr. Keith recognized this problem and presented charts to show the cost of transporting coal, oil and gas, and likewise, the relative transportation costs to produce a kw hour from coal, oil and gas. We reproduce, for your information, his chart shown in *Fig. 2.*

Mr. Keith assumed the thermal efficiency of coal at 28% and gas at 34%. You will note from this chart that the transportation cost of the fuels necessary to produce a kw hour is highest in case of coal transportation by railroad, and that even 600-Btu gas, when made from coal and transported by pipe line, has a lower transportation cost than coal transported by railroad. You will also note that natural gas transported by pipe line has a substantially lower transportation cost.

I have also prepared a chart, shown in *Fig. 3,* using the actual transportation cost applicable under the rate in effect on the Texas-California line. The gas is transported in that line at weighted average distance of 840 miles, and the transportation cost in round figures is 10 cents per Mcf. Using this figure for gas transportation cost, and the cost for the transportation of coal from Mr. Keith's charts, we have shown the relative cost of transporting the necessary fuel to produce a kw hour from coal, from 1000-Btu natural gas and from 900-Btu synthetic gas made from coal.

It is apparent at a glance that the transportation cost in the case of natural gas is subsantially lower than in the case of coal, and that the 900-Btu synthetic gas is only 10% higher than the natural gas, but that it is likewise substantially lower than the transportation cost in the case of coal. Expressed in dollars and cents, according to Mr. Keith's chart, it costs in excess of $6 per ton to transport coal 800 miles or more. In Mr. Keith's calculations, he uses a ton of coal as being the equivalent of approximately 29 Mcf of gas—14,500 Btu per pound. We use 25 Mcf as the equivalent of a ton of coal—12,500 Btu per pound.

Using the figure of $6 per ton as the transportation cost for one ton of coal 800 miles, and 25 Mcf of gas as the equivalent of a ton of coal, we have an equivalent transportation cost in the case of coal of 24 cents per 1000 cu. ft. as against 10 cents per Mcf—the actual transportation cost in the Texas-California line.

As shown by the statement of Mr. Keith before the Princeton Bicentennial—and as probably will be demonstrated by the pilot plant of the Pittsburgh Consolidation Coal Co.—in a very few years it will be commercially practical to make 900 to 950-Btu gas from coal in large quantities at the mouth of the mine. It is estimated that the total cost of such conversion will be approximately $1 per ton, and that the plant will be operated on a basis of 80% efficiency as respects the Btu in the coal. Consequently, one ton of coal in such a plant would produce approximately 20 Mcf of gas with a heat value of 900 Btu. Assuming a value of $2 a ton for the coal at the mouth of the mine and a conversion cost to gas of $1 per ton, we would have a cost at the discharge side of such a plant of 15 cents per Mcf for gas with a heating value of 900 to 950 Btu. This is not fantastic but is truly based upon the development of the art as it exists today and as it can be reasonably projected into the future. It is not unlikely that such a plant will produce a variety of by-products that may reduce this cost substantially.

Dr. W. K. Lewis, dean of chemical engineering, Massachusetts Institute of Technology, testified before the Interstate and Foreign Commerce Committee of the Senate on the hearing on the proposed amendment to the Natural Gas Act on the subject of the "Replaceability of Natural Gas." After reviewing the progress of the art, he said:

"Obviously synthetic natural gas from coal is in no sense economically out of the question in the near future.

"Still lower costs of conversion of coal to gas are to be expected. The art is in a state of rapid flux and development, where improved processing techniques are most likely to emerge. The possibility of taking advantage of developments such as the Lurgi reaction in connection with other methods of hydrocarbon synthesis is very attractive.

"An important element in the possibility of cost reduction is the fact that these modern processes use coal fires and can tolerate high ash of relatively low fusion point. They can also use low grade solid fuels, such as lignite. This is in sharp contradistinction to the conventional water-gas operation which requires lump coal and high fusion point ash, preferably small in amount. The results that will accrue from significant lowering of the cost figures quoted are obvious."

But aside from cost the experience of the last war demonstrated that the most dependable and effective means of transportation in time of war is the pipe line. The government during the war, as we all well know, spent hundreds of millions of dollars under top priority orders for the expansion of our oil and gas pipe lines as a prime necessity for the war effort.

A glance at the pipe line map shows that all the great trunk pipe lines either cross or are within easy striking distance of the great coal fields of Colorado, Illinois, West Virginia, Pennsylvania, New Mexico, Utah and Texas.

The natural gas industry has financed the present lines and is planning to finance these many extensions on the basis of amortizing their cost over the life of known natural gas reserves. The El Paso Natural Gas Co. has issued its bonds on the basis of amortizing the entire debt in a 20-year period, although the known reserves are estimated to exceed 30 years. This is generally true of the industry. Any other policy would have no basis in sound accounting practice and certainly no one with a true consideration for sound policy, both for the industry and the national economy, would advocate amortizing such costs upon any other basis. So the companies will be in a position, when these reserves are exhausted, to finance the necessary plant and lines to procure their supply from gas made from coal at the mine.

Since the principal part of this vast transportation system will be amortized out of known gas reserves, the system may be available, if necessary, upon a basis very much less than its original cost and upon such basis the transportation charges may be even less than projected.

So, as the natural gas industry expands its operations all over the nation, it is building not a temporary pipe line system for the exploitation of an exhaustible and irreplaceable natural resource, but it is building a new and more efficient and more economical transportation system to make fuel readily available from our practically inexhaustible supplies of coal. It is not disrupting our economy. It is, on the other hand, stabilizing it and probably is providing a solution to one of the most difficult problems that is facing the industrial world today—the mining and marketing of coal.

The natural gas industry has actually blazed a new trail and established the most efficient and economical, and therefore the cheapest, method for the transmission of energy—the transportation of gas by large diameter, high pressure pipe line.

The industry is not entitled to be thought of, consequently, as the unwanted waif left on the doorstep of our economy by the oil industry. It is entitled to new status as a full member of the national family, performing its full load of work in our peacetime economy and ready to take its place in the first line of defense in time of national emergency.

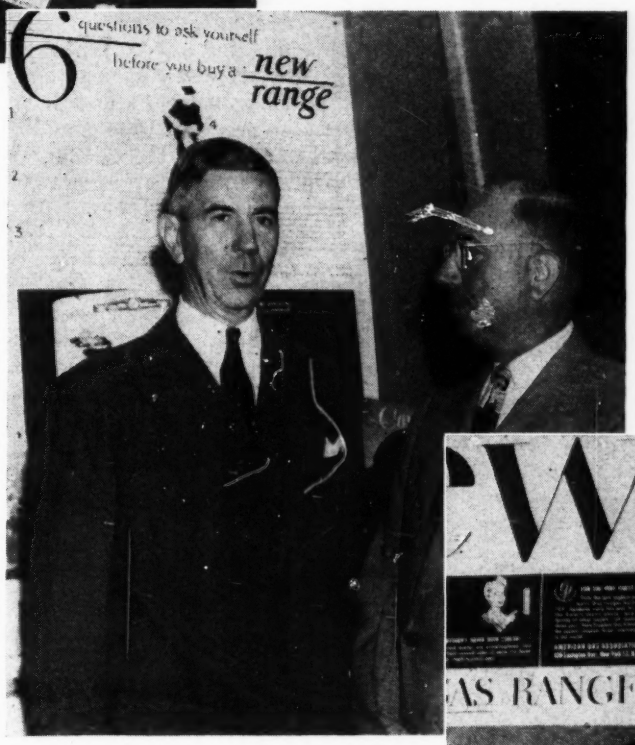
Cleveland Sidelights

Hugh Cuthrell, Brooklyn Union Gas Co., new AGA second vice president, and E. G. Boyer, Philadelphia Electric Co.

C. M. White of Republic Steel, featured convention speaker, and J. French Robinson, East Ohio Gas Co., Cleveland.

J. J. Quinn, Boston Consolidated Gas Co., a promoter of "Gas Has Got It," who spoke on the campaign.

Frank C. Smith, Houston Natural Gas Co., with Elizabeth J. Lynahan and F. X. Mettenet, both of Peoples Gas, Chicago. Miss Lynahan is new AGA Home Service Chairman.



ASSOCIATIONS

No Limits

Hargrove decries scarcity complex in keynote talk at AGA convention

By EDWARD TITUS

THE gas industry, running at an all-time high, must look through the right end of the telescope to see what lies ahead. "The image may be magnified, but it will indicate what we must build for and the services we must provide—we must raise our sights to new horizons in a new era."

These thoughts, voiced by R. H. Hargrove, in his presidential address, set the tone for the 29th annual convention of the American Gas Association, held in Cleveland Oct. 6-8.

"Our industry now stands at the peak of its activities," President Hargrove emphasized. It serves 20,600,000 customers and a population of more than 95 million people. Its revenues amount to $1¼ billion annually. Construction expenditures of gas utilities reached a peak of $310 million in 1946, an increase of 93% over the previous year. An estimated $730 million will be spent by utilities for new gas facilities in 1947, with more than half going to natural gas transmission.

"Some of us," Mr. Hargrove asserted, "have been too ready to admit restrictions to our growth and to define the limits of our progress. This is a shortsighted and unrealistic frame of mind. Any limits to our growth exist only in the minds of those who are too bound by outmoded methods."

President Hargrove went on with these thoughts:

Plaque presented by J. French Robinson, East Ohio Gas Co., to A. F. Bridge, Southern Counties Gas Co., and chairman, AGA Laboratories Managing Committee, honoring R. W. Gallagher, formerly AGA president and chairman of the Laboratory committee. Presentation was made on Wednesday, Oct. 8, designated as "Ralph W. Gallagher Day."

"When stating our case to the public we should take special pains to shatter forever the specter of a limited supply of gas. . . . Year by year our estimates of natural gas reserves have increased until today they represent an advance of 600% over 1925."

But in addition to natural gas, the gas industry's future resources may be counted in terms of oil and the almost inexhaustible supply of coal. The AGA has an unprecedented program of gas production research. (An example of what others are doing was detailed to a peak crowd in the Cleveland Music Hall by Joseph Pursglove, Jr., vice president, Pittsburgh Consolidation Coal Co., who told of research into the exciting future of the black diamond.)

"Under these circumstances can anyone question the certain development of improved gas-making processes or the relative permanence of an abundant supply of gas?" Mr. Hargrove asked.

New Demands

"Indications are that new demands will be made upon us which may require new concepts of service and regulation. Already there is evidence that gas may find unexplored markets in the chemical field. . . .

"We should be more than pleased that the American public has placed its unmistakable stamp of approval on gas as the most desirable of all fuels by greatly over-buying it. . . ."

Such, then, was the mood of the convention.

Where the uncertainties of everything dominated people's minds at the gathering in Atlantic City a year ago, this year some of the uncertainties had been removed, and others were dimming.

A case in point was the talk of Chairman Nelson Lee Smith of the Federal Power Commission. Mr. Smith's cordial invitation to cooperation between the industry and government led to a mood of accentuating the positive.

A desire for clarification of regulations for the benefit of both the industry and the consumer ran through Mr. Smith's speech. He was emphatic in telling his listeners that the commission has no desire to extend its jurisdiction beyond what was the intent of Congress. At the same time in those areas where the commission does have jurisdiction, he urged that the commission and the industry pull together to work out the definitions and the rules more exactly and satisfactorily.

Hands Off

Let the representatives of companies producing and distributing manufactured gas and utilities engaged in purely intrastate operations relax, he urged.

"I have no thought that their affairs are, or are likely to become, of such national interest as to require or justify federal regulation," he declared.

And on the other side of the picture Chairman Smith extended words of assurance regarding production and gathering of natural gas.

"Actually," he said, "the commission has never sought in any way to exercise control over either the independent producer or gatherer, the price at which he sells his gas to a pipe line, or the processes of production and gathering even when carried on by natural gas companies otherwise subject to its jurisdiction. . . .

"I can see no justification for an extension of federal control over thousands of individuals and firms engaged in gas exploration, development, and production. . . . The commission has proposed language to sharpen and give emphasis to the exemption of independent production and gathering. . . ."

Regarding end use, Mr. Smith declared the Commission has been seeking, through a case-by-case method, "to give full effect to the exemption from federal regulation plainly intended by Congress."

Possibly the most interest and surprise was occasioned by Mr. Smith's interest in considering a commodity wholesale rate basis for natural gas.

He pointed out that for the most part the natural gas industry advocates rate making which would reflect the assignment of a field price to gas produced by pipe lines and their affiliates.

"In simplest terms," he declared, "it does not seem to me reasonable that gas coming from a common pool should have one value—presumably determined by demand and supply—if taken from the well of an independent producer, and another value—fixed by regulatory authority on the basis of net cost alone—if drawn from an adjacent well owned by a pipe line or its affiliate."

He said there was "no doubt about the necessity of giving recognition to commodity value of natural gas."

Public relations, particularly from the angle of what to tell the public this winter when the inevitable shortages come along, occurred again and again as a theme of the convention.

Looking forward to this winter's shortages, President Hargrove pointed out that the industry last winter was buffeted about in the public press and "has suffered some loss of prestige because it has not told its side of the story as promptly, completely and effectively as it should have done."

"Let us take the public into our confidence," Mr. Hargrove urged. "If any company is facing demands greater than its system can meet, let us use every channel of communication at our command to tell our customers the facts of the situation."

WINNERS OF AGA MEDALS

H. D. HANCOCK
DSA winner

E. G. BOYER
Beal Medal

H. P. MOREHOUSE
Gas Heating Progress

HALL HENRY

A capacity general session audience paid the closest attention to the informed, straight-from-the-shoulder talk of C. M. White, Republic Steel.

It would take more than two years to expand the capacity of the nation's steel industry by 10 million tons annually, Mr. White pointed out. In addition, 1.5 million tons of finished steel now desperately needed would have to be taken from steel users today to build the new facilities. Under today's high construction costs, he added, the million tons of increase—which might be regarded as Republic's share of the national total—would represent an investment of well over $200 million. Because of abnormal construction costs, the steel turned out in these new facilities would have to be priced at least $20 a ton higher than the present to avoid a loss.

"It is my firm belief," the steel executive said, "that our whole national economy will be on a much sounder basis, if we produce at the highest possible level with our present facilities supplemented with such improvements as are required to keep them at a high point of efficiency."

Speaking as president of the Gas Appliance Manufacturers Association, D. P. O'Keefe touched on various shortages and declared that curt and arbitrary notices of gas shortages hurt the industry.

The Gas Has Got It theme was emphasized in the speech of J. J. Quinn, vice president, Boston Consolidated Gas Co., as well as in the big banner in back of the stage at the Music Hall, and in the printing on everybody's badge. . . . H. Carl Wolf, managing director of the AGA, presented the association's report, and discussed plans to integrate efforts to conserve food.

This year's AGA convention was truly a mighty occasion. It would be folly in the space available to attempt to do justice to all the brainwork that went into speeches, papers, reports, discussions, and informal talks.

Hancock Wins High Honors at AGA Convention

RECOGNITION of outstanding services to the industry during the past year was made on Oct. 7 at the AGA convention with the presentation of awards in six separate competitions.

Harry D. Hancock, president, Gas Advisers, Inc., received the AGA Distinguished Service Award for having made the most outstanding recent contribution of an individual toward the advancement of the gas industry. Mr. Hancock was honored for his advocacy of thin wall high tensile strength pipe for long distance natural gas transmission at high pressures. He was further commended for continued and successful efforts in compressor station piping design and specifications which have resulted in safe and economical operation of such stations.

Mr. Hancock has been chairman of the Technical and Research Committee of the AGA Natural Gas Department for the past three years.

The Beal Medal was awarded to Edward G. Boyer, manager of the gas department of the Philadelphia Electric Co., Philadelphia, for contributing the best paper to Technical Section meetings of the association throughout the year. "Economic Production for Gas Loads Ahead" was the choice.

The Coroaire Heater Corp. sponsored a Gas Heating Progress Award for individual achievement in the field of creating, maintaining and increasing consumer demand for gas house heating. H. P. Morehouse, assistant gas sales manager, Public Service Electric and Gas Co., Newark, was awarded first prize of $500 for his outstanding work in the upgrading of gas heating installations. Hall M. Henry, director, gas operations, Negea Service Corp., Cambridge, Mass., received second prize of $250 for his study of the economics of a high Btu gas process with which to supply the heating load. Third prize of $150 was presented to W. H. Wise, manager, domestic sales engineering, The Peoples Gas Light & Coke Co., Chicago, for his sales and installation program for gas conversion burners.

In recognition of the "cool courage, intelligence, quick decision and the risking of his own life during the disaster which befell Texas City in the chemical plant explosions beginning on April 16," James Walter Williams, a Houston Pipe Line Co. meterman, was presented with the AGA Meritorious Service Medal.

Individual accomplishments in the home service field were recognized with the announcement of five winners of the AGA Home Service Achievement Award sponsored by McCall's.

Eleanor Lee Jones, The Ohio Fuel Gas Co., Columbus, received $200 as winner of Division A, including home service departments of three or more individuals. Gladys V. Bramblett, home service director, Fall River Gas Works Co., Fall River, Mass., was presented with $200 as winner of Division B. Three prizes of $200 each were awarded in Division C confined to individual home service department members. Winners in this division were Mrs. Florence Hundley, Southern Counties Gas Co., El Monte, Calif.; Mrs. Kathryn O. Johnson, Rockland Gas Co., Inc., Spring Valley, N. Y.; and Helen F. Vernon, The Manufacturers Light and Heat Co., Bellevue, Pa.

Representatives of four operating units of gas companies received AGA Merit Awards for accumulating 1 million or more man-hours of work without a disabling injury accident. They were: Distribution District 4, The Ohio Fuel Gas Co., Mansfield, Ohio; Fort Wayne Division, Northern Indiana Public Service Co.; the telephone system of Equitable Gas Co., Pittsburgh; and the Production Department, Lease and Engineering.

TSTANDING SERVICE TO THE GAS INDUSTRY

W. WILLIAMS
for bravery

ELEANOR JONES

GLADYS BRAMBLETT

FLORENCE HUNDLEY

KATHRYN JOHNSON

HELEN VERNON

five winners of AGA Home Service Achievement Award

At Coronado

Industrial relations chief topic at PCGA's 54th annual convention

By BILL CLARK

MIXING business with pleasure to suit the taste, the Pacific Coast Gas Association put together a program that proved to be a tasty dish for 795 gas men and women who attended the 54th annual convention of the association, held at Coronado, Calif., Sept. 23-25.

Discussions of important topics by important men in five general sessions and one Manufacturers Section meeting competed with the lure of the surf, the hotel swimming pool, jai alai matches across the border, and other extracurricular activities for conventioneers' attention. The result was a tie, which was as it should be.

C. Johnstone
Managing Director

If any trend in industry thinking could be reported as a result of the discussions, a growing concern over industrial relations would be the inevitable choice. No less than three speakers dwelt at length upon current problems in dealing with labor, although the viewpoint and approach differed among all three.

The talks of Louis Ruthenburg and Leroy Edwards dwelt upon the Taft-Hartley Act, while Guy Wadsworth dealt with details of personnel management.

In an address titled "Three Pressing Problems," delivered before the Manufacturers Section, Mr. Ruthenburg, Servel president, devoted most of his attention to the Taft-Hartley Act, which he labeled "a rather confused attempt to correct earlier legislative mistakes."

"Those who support it and those who oppose it have spouted volumes of sheer nonsense," he declared. "It is not a 'slave law'; neither does it restore the 'prerogatives of management.' . . . This measure attempts to protect union members from undue coercion by labor barons."

As for management, it has definite responsibilities—to consumers, workers, owners, government, and the public interest. What is needed in order to discharge such responsibilities effectively is "a certain freedom of action and a certain measure of authority," he reminded his listeners. This the law does not do; in fact, "to questions of management - employee relationships few dependable answers will be found in new laws."

He blasted at past laws which have contravened the basic precept for the government of free men as enunciated by Aristotle: "The only stable state is that where everyone possesses an equality in the eyes of the law."

One partial solution lies in management's achieving understanding and a new philosophy and transmitting these to the groups for which it is a trusteeship. A greater degree of communication from top to bottom—working both ways—must be attained.

Mr. Edwards, in his remarks as president of the association, held out a greater degree of hope for the Taft-Hartley Act than did Mr. Ruthenburg. He saw in it an instrument to promote industrial peace, by protecting both labor and management in their basic rights, and outlawing certain practices by labor leaders which were harmful to the American people as a whole.

"Neither the common law nor the Fourteenth Amendment to the constituion confers the right to strike," Mr. Edwards said. "The Taft-Hartley law does not violate constitutional rights. What the Congress has given it has, in part, taken away legally." He recalled that the Wagner Act had protected labor in its right to strike, but had not defined this right, so labor leaders had promptly construed this right to include even physical violence. And, through personnel changes on the Supreme Court bench, many of these so-called rights had been upheld.

Mr. Wadsworth took a different tack. "The Taft-Hartley Act is new and untried," he said, and declined to discuss it. He chose to talk on "the one basic problem in industrial relations that can be discussed without speculation—the individual happenings on the job that, in the aggregate, determine the tone of industrial relations in the company.

"While a decade or more of intensive organizing and collective bargaining activity has served to emphasize much that is negative in relations between employers and employees, there is considerable convincing evidence that the average worker prefers to think well of his job, and of the

PCGA AT WORK...

TOP RIGHT: PCGA's outgoing president Leroy Edwards welcomes speaker R. H. Hargrove.

TOP TO BOTTOM, FROM LEFT: Speakers D. A. Hulcy, Guy Wadsworth and Alden Roach, featured on the program of the PCGA's 54th annual convention.

company for which he works," he said.

Mr. Wadsworth dispensed with the strictly economic issues of collective bargaining, likening them to a business deal—with modifications.

"Unions . . . seek to shift control and direction of a company's working forces from the employer to themselves. The practical state of industrial relations in any company depends far more upon the degree of control that the union succeeds in establishing over ordinary happenings on the job than on strictly economic conditions."

Personnel management, but at the foreman level, was seen as the best solution to the problem.

To a lesser degree, C. A. Renz, manager of customer service, Southern California Gas Co., touched upon foremen's responsibilities in his paper titled "The Use of Technology in the Administration of Service to The Customer," the third and final installment of which appears in this issue of GAS. (The talks by Mr. Wadsworth and Mr. Kayser are also presented elsewhere in this issue.)

True to form, the "Biggest Inch," pipe line from Texas to California, was one of the stars of the show. Alden Roach, president of the pipe fabricators, Consolidated Steel, discussed the making of it: a preview of the film centered about its construction was shown; and Paul Kayser, president of the company which is to supply the gas for it, El Paso (Texas) Natural Gas Co., used it as a springboard for a general discussion of the possible "permanency" of the nation's system of natural gas pipe lines.

"The entire United States . . . is being gridironed with a network of natural gas lines extending to all centers of population throughout the entire nation," declared Mr. Kayser. "When we complete the Texas-California line . . there will truly exist a transcontinental pipe line of large diameter stretching across the country from east to west."

Quoting extensively from P. C. Keith and others who have studied the feasibility of gasifying coal, Mr. Kayser predicted that the process would one day compare favorably in cost with coal itself, and pointed out that at such time the grid of natural gas lines, all of which cross or are within short distance of all major coal fields, may be made to transport gasified coal. Furthermore, this grid will have been all paid for by that time.

Promotion within the industry received a three-way boost from D. A. Hulcy, president, Lone Star Gas Co., AGA President R. H. Hargrove, and AGA Managing Director H. Carl Wolf.

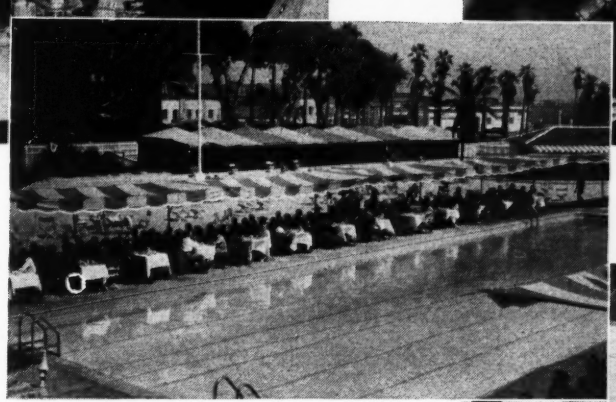
As Mr. Hulcy reminded his hearers, Oct. 1 marked the conclusion of the first three-year period of the association's three-year promotion program, of which he has served as committee chairman. He traced the program from the birth of the Promotion Bureau in 1945 through the New Freedom Kitchen plan, reference manual, work in expositions, commercial cooking promotion, home economics educational programs, to the inception of Gas Has Got It.

Mr. Hargrove, speaking on "The Gas Industry Nationally," told the group of the work done by F. M. Banks committee on reviewing the program and of the committee's recommendation that the program be continued with modifications, accepted last spring by the executive board.

Dr. L. A. DuBridge, president, California Institute of Technology, a top authority on nuclear fission, scotched over optimism about the possibilities of atomic power as a fuel within the near future. He foresaw the passage of 30 to 50 years before it could become a major source of power, basing this on the fact that in order to have an abundant supply of power comparable with the supply of coal, from this source, it would be necessary to convert U-238 to plutonium, a process that would require many years before a stockpile could be built up.

And then — "We'll still need full-scale production of other fuels to meet the increased demand," he said.

Other excellent talks included: "Gas



. . . AND AT PLAY

TOP RIGHT: Leroy Edwards pours from bowl fashioned from section of "Biggest Inch" for Mrs. F. S. Wade. Mrs. Edwards, Mr. Wade look on.

TOP LEFT: R. W. Hendee, Mrs. A. F. Bridge and Mr. Bridge, H. Carl Wolf, Ludlow Shonnard, Mr. and Mrs. D. A. Hulcy, Mrs. Hendee.

BOTTOM RIGHT: Being serenaded at the swimming pool luncheon, Argyle Franklin, Edith Harwood, Marjorie Annin, Elizabeth Sweeney, Gladys Price, Ethel Shadow, Katherine Rathbone, Clara Ridder, Phyllis Snow, Rita Calhoun, home service representatives and their guests.

Industry Research," by E. S. Pettyjohn, Institute of Gas Technology director; "The Institute of Gas Technology," by F. H. Lerch, Consolidated Natural Gas Co.; "Equipment-Research in Action," by Elizabeth Sweeney, McCall's magazine; "The Gas Industry in California and its Future," by H. P. Huls, president, California Public Utilities Commission; "A Training Program for Company and Dealer Salesmen," by R. C. Terradell, Southern California Gas Co.; and "The LP-Gas Business—What It Is and Who Does It," by H. L. Costello, Standard Oil.

Lab Now 22

Departmental activities show heavy increase

Marking the completion of 22 years of operations, the AGA laboratories managing committee noted the significance of its "CP" approval plan in over-all activities in its annual report.

The committee stated:

"Despite increased costs of operations, it is estimated that the ultimate cost of the approval plan to consumers remains at 5 cents per appliance."

Increases in individual departmental services of the labs ranged from 22% for requirements activities to more than 80% for inspections operations. Testing of appliances for approval increased over 30% while research activities mounted about 50%.

At the same time, sharp rises in appliance production led to a total increase of approximately 40% in 1946-1947 laboratory operations over the year before, exceeding the level of war-work years by 20%.

Recent expansion of the testing department in preparation for an increased volume of work proved adequate to handle an increase of 50% in the number of appliances checked last year, some 3000 models.

New developments in appliances submitted included several innovations. In the space heater field, designs were submitted incorporating in-the-wall construction employing outer wall flue discharge and introduction of outside air for combustion. Unit heaters for the first time employed horizontal instead of vertical tube construction in small types. Water heaters and accessories of more streamlined design appeared. Several clothes dryers and incinerators of new design were tested.

PCGA Awards

K. L. Boosey

For his paper, "Wilful Payment vs. Forced Collection," which appeared in the October, 1946, issue of GAS, K. L. Boosey, Pacific Gas & Electric Co., was awarded the Gold Medal of the Pacific Coast Gas Association, presented at the convention. Mr. Boosey's paper won honorable mention at last year's convention, and the awards committee at that time recommended that it be given further study and consideration for the Gold Medal.

The paper suggested a method whereby shutoffs of service to delinquent accounts could be materially reduced.

Other awards winners, chosen by the committee headed by F. C. Packer, were: Technical Section, K. B. Anderson, chairman, given the Basford Trophy for most outstanding accomplishment among sections; the committee which prepared the motion picture "The Miracle Flame," given the committee award with gold medal for the chairman, R. R. Gros, Pacific Gas & Electric Co.

Tribute was also paid to the Sales Training Committee under R. C. Terradell, Southern California Gas Co., for organizational work on the association's sales training course; A. W. Turner, Southern California Gas Co., and his Special Committee on California Safety Orders, and E. C. Hunt, PG&E, first chairman of the committee.

A G A Notes

Technical Studies. Results of studies on flame impingement and effects of ambient pressures in combustion chambers, sponsored by the Committee on Domestic Gas Research, have been released by the AGA Testing laboratories.

Research Bulletin No. 43, "Investigation of extent of Gas Flame Impingement Allowable for Satisfactory Combustion," presents data on factors affecting combustion due to flame impingement such as type of gas, variations in materials and surfaces impinged upon, and temperatures of such surfaces. Experimental results obtained on several burners are given to illustrate effects of these factors on combustion.

Research Report 1080, "Research in Effects of Ambient Pressures in Combustion Chambers of Contemporary Appliances on Primary air Injection, Flame and Other Gas Burner Operating Characteristics," rounds out earlier studies made of the effects of ambient temperatures. Both new studies were conducted under the supervision of the Technical Advisory Group for Burners, Controls and Accessories Research.

Employee Relations. Personnel executives from gas utilities throughout the nation have been invited to attend an Employee Relations conference which will be held at the Adolphus hotel, Dallas, Nov. 19-20. The two-day program of discussions on employee relations and practices is under the sponsorship of the personnel committee, Southwest Personnel conference, and the Midwest Personnel conference of the AGA.

Scheduled speakers and subjects:

Benjamin Werne, counsellor of law and lecturer at New York University graduate school of business administration—"Operating under the Taft-Hartley Law."

Joe Bevis, vice president, Opinion Research Corp., Princeton, N. J.—"Finding Out What Your Workers Think."

William H. Lough, president of Trade-Ways Inc.—"Modern Employee Training Methods."

John C. Flanagan, vice president, United Gas Corp., Houston—"Top Management and Employee Relations."

Fred R. Rauch, vice president, Cincinnati Gas & Electric Co.—"Whys and Results of Job Evaluation."

C. E. Jurgensen, personnel director, Minneapolis Gas Light Co.—"Uses and Abuses of Employment Tests."

W. H. Senyard, director of personnel, Louisiana Power Co.—"Trends in Communication with Employees."

Midwest Personnel Conference. Succeeding D. L. Sedgwick, superintendent of gas operations, Kansas Power and Light Co., Salina, Vernon Myers was elected chairman of the AGA Midwest Personnel Conference at a meeting in Colorado Springs, Colo., Sept. 12. Mr. Myers is assistant to the president, Sioux City Gas and Electric Co., Sioux City, Iowa.

Vernon Myers

Approximately 40 executives in charge of industrial relations of midwest gas companies attended the conference. Kurwin R. Boyes, AGA secretary, suggested increased emphasis on employee selection techniques; more effective training of employees, and the organized recruitment and training of potential executives, both administrative and technical.

Other speakers were Robert W. Hendee, president, Colorado Interstate Gas Co. and AGA vice president; Fred R. Rauch, who also spoke at the South-

west Personnel Conference in Tulsa, and R. L. Thomas, newly elected secretary of the conference.

Conversion Burners. Testing is under way on gas conversion burners under a new set of listing requirements at the AGA laboratories. Resumption of testing for certification of conversion burners, following its temporary suspension, was approved by the laboratories managing committee after adoption by the approval requirements committee of extensively revised standards covering such burners.

Appropriate notice has been sent to all conversion burner manufacturers on record, and the new requirements supplied them. Additional copies are obtainable from the laboratories in Cleveland and Los Angeles. Listing in the Directory of Approved Gas Appliances and Listed Accessories of burners meeting the new requirements will follow completion of satisfactory test results.

Southwest Personnel Conference. A total of 23 conferees representing 15 companies were in attendance at the 18th meeting of the Southwest Personnel Conference of the AGA held Sept. 10, in Tulsa. W. H. Senyard, personnel director of the Louisiana Power and Light Co., presided, and Fred Rauch, vice president, Cincinnati Gas and Electric Co. and chairman of the AGA personnel committee, delivered a significant address entitled "Some Pointers on Negotiations."

Diplomas awarded. More than 250 diplomas have been awarded to the men who attended the Industrial Gas school in Washington last spring. Everyone who took the examinations at the close of the course received a passing grade or better, and more than half of the students received an A or an A+ which means a mark of over 90% or 95% respectively.

Harry A. Sutton of the Public Service Electric and Gas Co., Newark, president-elect of New Jersey Gas Association (center), receives gavel from Preston D. Gardner of Camden (right), whom he succeeds as president of the association. Elmer A. Smith of Newark, secretary and treasurer, looks on at left.

OTHER ASSOCIATIONS

NJGA Centennial

THE centennial of gas in New Jersey was observed at the Sept. 23 meeting of the New Jersey Gas Association with discussions in which gas men asked themselves where they stood on public relations and consumer service after 100 years. It was the 32nd annual meeting and the first since 1940 to which the whole membership was invited. The crowd at lunch overflowed from the grand ballroom of the Stacy-Trent hotel in Trenton.

"Public relations is a great thing if it's an exact interpretation of what you've got," declared Dr. James Lee Ellenwood, executive secretary of the New York State YMCA, who spoke on "Serving the Public — its Obligation and Reward."

"But," Dr. Ellenwood continued, "I'm now getting fed up with public relations. It's too often putting your best foot forward, and lots of times your best foot isn't forward. The public is tired of having only the best side of an industry presented."

The New York subway, he said, doesn't deny that "you are shoved in like cattle, and the thing I like about their public relations is they don't claim anything else. They make no pretense, but merely tell you they get you there."

"The public has no emotional attachment to its public service organizations," Dr. Ellenwood warned. "You must never expect praise. But see that the public relations policy penetrates to the last man. Make sure that if the ideals of management are good they penetrate through to the consumer through the entire organization. A company is as good as its personnel practices."

Carrying on the theme in a talk entitled "We All Meet the Customer," Henry R. Flanegan, assistant manager, customer service department, Philadelphia Electric Co., urged a "self-audit, or review of our procedures that affect customers."

"We should survey those things that are in the area of our own control," he declared. "Suppose the customer who buys a range doesn't want his payments on his gas bill. We say it goes on his bill. But he wants a little book for a record. And our attitude may look arbitrary to him.

"We question the credit standing of a customer, and want a guarantor. But the boss can't be the guarantor because he lives in another community."

Mr. Flanegan advocated, as a basic essential "a department through which complaints will channel, and receive direct management attention."

Donald K. Smith of Rochester Gas and Electric Corp., Rochester, N. Y., read the paper of Robert E. Ginna, vice president of the Rochester company, who was unable to attend because of illness. Points made included:

"Our primary job is to get back into the house heating business in a big way. . . . Now is the time to consider rate increases. . . . Your customers should be told frequently about efforts to make house heating available to them. . . . You may have to abandon 18-karat free service."

The Association's year was reviewed by Preston D. Gardner, president, New Jersey Gas Association. In a talk entitled "The Gas Industry Looks to the Future," Edwin L. Hall, coordinator of gas production and general technical research of the American Gas Association, told the present status of research. Dr. Ralph L. Lee, public relations department, General Motors Corp., discussed "Leadership and What It Takes," and Bernard A. Seiple, president, Jersey Central Appliance Co., Asbury Park, N. J., talked on "Deal in the Dealer."

For the coming year the following officers were elected:

Harry A. Sutton, of Public Service Electric and Gas Co., Newark, president; Howard H. Melvin, of Millville, N. J., first vice president; Lewis W.

Becker, Jr., of Elizabethtown Consolidated Gas Co., of Elizabeth, N. J., second vice president. Elmer A. Smith of Newark continues as secretary and treasurer.

CNGA Fall Meet

FIVE top men from the petroleum field combined to present an interest-packed program for the 22nd annual fall meeting of the California Natural Gasoline Association, held Oct. 10, Ambassador Hotel, Los Angeles.

Fuel and energy supplies for today and tomorrow shared the billing with reports of technical progress in producing, transporting, and marketing gas and natural gasoline.

First speaker to take over the platform was Marion E. Dice, General Petroleum Corp.'s manager of the economics department, who gave his expert views on the "Fuel and Energy Outlook in the West." Mr. Dice saw no oil shortage in California, citing the fact that in the postwar period stocks on hand have jumped from 75 to 95 days. And, he pointed out, there are still plenty of places left in which to look for oil. He implied that a higher price for petroleum products would enable western explorers to increase the size of existing fields merely by drilling in marginal territory heretofore economically unprofitable.

An economic and operational evaluation of the centrifugal compressor installation at the Seeligson project in Texas wound up the morning's business. This was presented by Dan T. McDonald, chief process engineer for Magnolia Petroleum Corp.'s natural gas department.

One of the day's most provocative talks was given by E. J. McLaughlin, and J. A. Miller, California Research Corp., who detailed the part played by natural gasoline in discussing "The Significance of Fuel Sensitivity in the Performance of Motor Gasolines."

Roy M. Bauer, gas supply supervisor for Southern California Gas Co., told of the Biggest Inch and other developments contributing to the natural gas supply in California. Final speaker of the day was E. O. Bennett, consulting engineer, who discussed "Cycling at High Pressures vs. Depletion and Cycling at Low Pressures."

Oklahoma Utilities

PREVENTION or reduction of losses from pipe corrosion and leakage were discussed in papers presented at the annual meeting of the Gas Division, Oklahoma Utilities Association, at the Biltmore hotel, Oklahoma City, Sept. 19.

External pipe corrosion may be prevented by placing expendable anodes in holes adjacent to hot spots where electric currents are doing their destructive work, said W. E. Huddleston, Huddleston Engineering Co., Bartlesville. These anodes, located according to careful soil surveys, would protect the pipes for from 8 to 10 years, he asserted.

Better pressure regulation will greatly reduce losses from leakage in gas distribution systems, K. R. D. Wolfe, Fisher Governor Co., Marshalltown, Iowa, told the gas people. He described new regulators and devices, which, if installed, will lower the amount of unaccounted-for gas in distribution lines 50% and reduce customer complaints 75%. This equipment automatically controls the pressure in the lines between low and peak-demand periods.

Eating places are great builders of the commercial load if given proper attention by the selling and service departments of a gas company, L. J. Fretwell, Oklahoma Natural Gas Co., Tulsa, stated.

The growing possibilities of year-around air conditioning as a load builder for the gas companies was emphasized by J. A. Gilbreath, sales manager, air-conditioning division, Servel, Inc., Evansville, Ind.

New developments in heating were discussed by Carl Dean, sales director, Heating Research Corp., Muncie, Ind. The heat pump and various forms of panel heating were described by the speaker.

These delegates to the Oklahoma Utilities Association Gas Division meeting in Oklahoma City, Sept. 19, are engaged in a little side-play conversation. They are, from left to right: L. A. Farmer, Northern Oklahoma Gas Co.; D. W. Reeves, Gas Division, OUA; and A. F. Potter, Gas Service Co.

IPA On Steel

DETERMINED opposition to the granting of permits by federal agencies for exportation of steel, which is "so greatly needed here at home to meet the emergency recognized now existing," was expressed in resolutions adopted by the national convention of the Independent Petroleum Association of America meeting at Oklahoma City, Sept. 27-30.

One cause of the opposition was admission by James Terry Duce, vice president of the Arabian-American Oil Co., that the Department of Commerce had granted a license to move 20,000 tons of scarce steel to the Middle East for the building of a 1040-mile oil pipe line to stretch across Syria, Lebanon, Trans-Jordan and Saudi-Arabia.

Krug to Address API

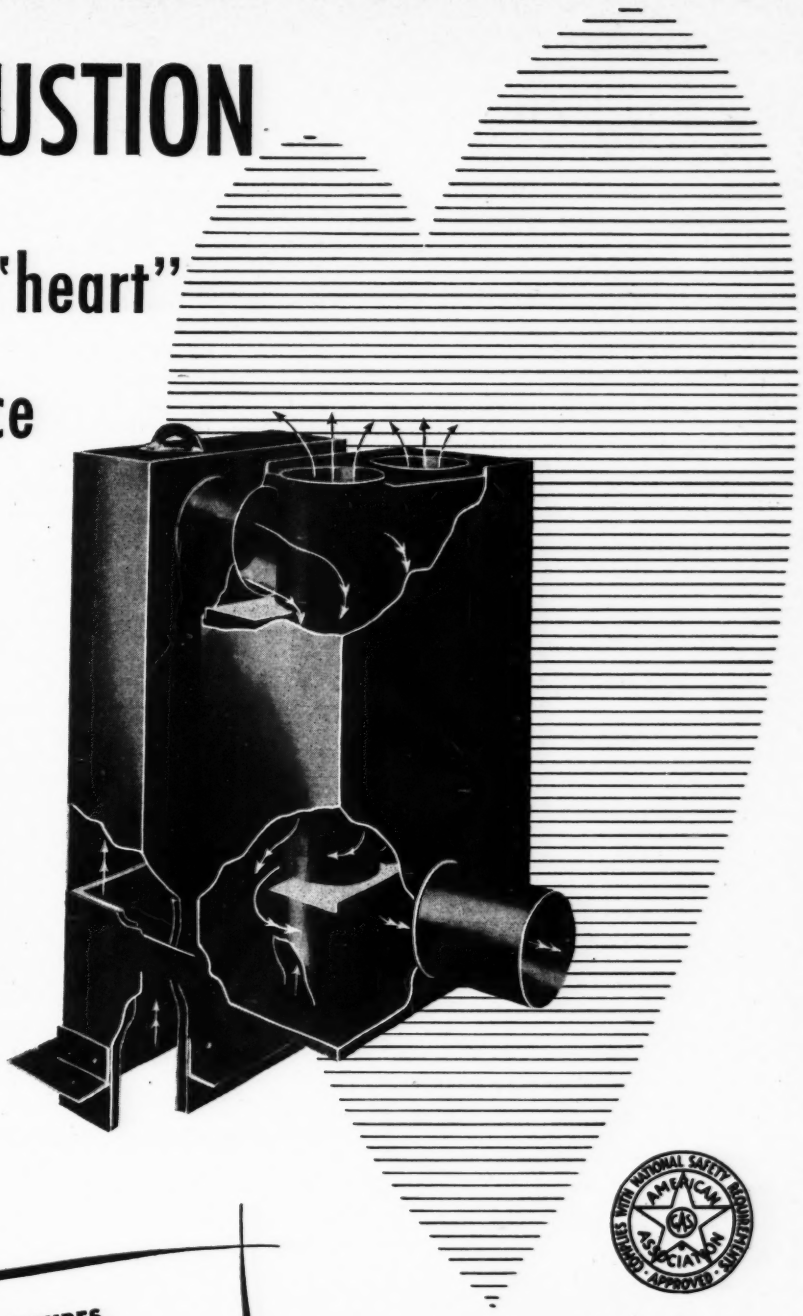
Secretary of Interior J. A. Krug leads a list of distinguished speakers scheduled to address the 27th Annual Meeting of the American Petroleum Institute in the Stevens hotel, Chicago, Nov. 10-13.

At the first of three general sessions which will highlight the meeting, Mr. Krug will speak on Wednesday afternoon, Nov. 12. Election of directors for the ensuing year will also take place at this session.

Young Leadership

In keeping with the petroleum industry's tendency to maintain a young and progressive leadership, 37-year old R. B. Anderson was elected president of the Texas Mid-Continent Oil & Gas Association at the group's 28th annual meeting in San Antonio, Oct. 16-17.

WARD COMBUSTION CHAMBER—the "heart" of the Ward Furnace



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WARD HEATER COMPANY
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Los Angeles 7, California

WARD
FLOOR FURNACES

EXPANSION

The Big Inch

FPC grants permanent certification for TETC operation of system

TEXAS Eastern Transmission Corp. has received from the FPC a permanent certificate to operate the Big Inch system and to supply the Philadelphia and Appalachian markets. However, the following four conditions are imposed by the commission:

1. Texas Eastern shall make four small sales contracts in areas adjacent to its line west of Ohio.

2. It shall continue to supply 20 MMcf per day to Panhandle Eastern Pipe Line Co. or its customers.

3. Until the line reaches full capacity, gas to Appalachian customers shall be supplied according to an FPC plan rather than according to contract terms.

4. During the present shortage, 5 MMcf per day shall be held available for emergency allocation by the FPC in the Appalachian area.

The commission considered all requests for Big Inch gas according to need for gas, amount required, and distance from the main line. In addition to 10 compressor stations authorized last March, the new certificate authorizes 11 more. Sixteen of the 21 stations will be equipped with centrifugal-type compressors powered by electric motors.

Input capacity by August, 1948, is expected to be 450 MMcf daily to satisfy demands for 435 MMcf daily.

More Gas for East

Proposed pipe line projects will increase daily supply to northeast 775 MMcf

TWO transcontinental pipe line projects, designed to increase by 775 MMcf daily deliveries to the northeastern U. S., are awaiting the Federal Power Commission's okay.

Hearing was scheduled for Oct. 27 in Washington on a project planned by Transcontinental Pipe Line Co. to build a major line from the Rogers Lacy field near Mercedes, Texas, to the Philadelphia-New York area. The 26-in. line will extend 1839 miles and will cost approximately $150 million.

Construction will be started in March, 1949, and completion is scheduled for November, 1950. Initial capacity will be 325 MMcf. Other facilities proposed include construction of 18 compressor stations with an aggregate of 186,000 installed hp, lateral lines to serve the Philadelphia and New Jersey areas, and a number of gathering lines in Texas.

Tennessee Gas Transmission Co. has requested permission to increase its system capacity by 450 MMcf daily to meet demands for Eastern New York and New England customers. The company is now laying a parallel line to its line from the Rio Grande valley to West Virginia, which will give a daily capacity of 600 MMcf. The new proposal is to increase deliverability to 1055 MMcf per day and to build an extension to a terminal near Boston. Estimated cost is $150 million.

TGT has asked permission to: (1) Construct five new compressor stations with a total of 50,000 hp and to add new compressor units totaling 125,200 hp to existing stations. (2) Lay 770 miles of 30-in. and 124 miles of 26-in. loop line along existing lines. (3) Lay an extension of 790 miles of 26-, 24- and 20-in line from Burnaugh, Ky., to a point near Boston. (4) Build a 65-mile, 16-in. spur from a point in Eastern Ohio to a point near Pittsburgh. (5) Construct various lateral gathering lines and facilities in the Southwest to tap new sources of gas supply.

New Carthage Outlet

Temporary authorization to construct additional pipe line facilities for transport and sales of natural gas produced in the Carthage field, Texas, to Texas Eastern Transmission Corp. near Longview, Texas, has been granted the United Gas Pipe Line Co., Shreveport, by the FPC. Carthage gas will be delivered into United's Dallas District system west of Longview.

Facilities requested in the company's application include about 33 miles of 20-in. natural gas transmission line extending from Carthage field, Panola county, to a point near Longview for the transport of approximately 100 MMcf daily of United's gas to Texas Eastern. It will also transport gas purchased at the Carthage field by Texas Eastern from the Lone Star Co. and the Chicago Corp.

Nine miles of 10-in. lateral line to connect with the gasoline plant of Lone Star Gas Co. in the Carthage field have also been authorized to carry the Lone Star gas to the proposed 20-in. line for delivery to Texas Eastern.

CALENDAR

November

Southern Gas Association Southeastern Section, Home Service Workshop—Atlanta, Ga., Nov. 6-7.

American Petroleum Institute — Stevens Hotel, Chicago, Nov. 10-13.

National Hotel Exposition—Grand Central Palace, New York, N. Y., Nov. 10-14.

Mid-Southeastern Gas Association —Raleigh, N. C., Nov. 13-14.

AGA Employee Relations Conference—Adolphus Hotel, Dallas, Texas, Nov. 19-20.

Wisconsin Utilities Association—Joint Convention of Gas & Electric Sections, Commercial & Technical Divisions, Schroeder Hotel, Milwaukee, Nov. 19-21.

New England Home Service Conference—Boston, Nov. 20-21.

January, 1948

AGA Home Service Workshop —Congress Hotel, Chicago, Jan. 22-24.

Mid-West Gas Association Annual Meeting—Place not selected, April 8-10.

February

Eighth International Heating & Venting Exposition — Grand Central Palace, New York, N. Y., Feb. 2-6.

March

New England Gas Association Annual Business Conference — March 18-19.

Southern Gas Association Annual Meeting—Galveston, March 24-26.

Mid-West Regional Gas Sales Conference—Edgewater Beach Hotel, Chicago, March 29-31.

April

Gas Appliance Manufacturers Association Annual Meeting — Drake Hotel, Chicago, April 5-7.

American Gas Association Sales Conference, Industrial and Commercial Gas Section—Windsor, Canada, April 7-9.

Joint AGA-EEI National Conference of Electric and Gas Utility Accountants—Hotel Jefferson, St. Louis, Mo., April 12-14.

National Restaurant Association Show—Cleveland, Ohio, April 12-17.

Distribution-Motor Vehicle Conference—Hotel William Penn, Pittsburgh, Pa., April 19-21.

Indiana Gas Association Convention—French Lick Springs Hotel, French Lick, Ind., April 22-23.

More Gas for Tennessee Basin

To provide adequate gas service for the industrial and commercial centers of the upper Tennessee river basin, Mid-East Tennessee Natural Gas Co. is planning construction of a 106-mile transmission line from Southern Natural Gas Co.'s proposed facilities near Chattanooga to Knoxville, Tenn. Southern Natural has contracted to supply Mid-East Tennessee up to 22 MMcf daily for a period of 20 years.

Initial delivery capacity of the line would be about 25 MMcf daily with a single compressor station. A second compressor station would increase capacity to 30 MMcf daily. Industries in the area include the Tennessee Valley Authority, the Atomic Energy Commission at Oak Ridge, and the Aluminum Co. of America at Alcoa.

Application has been filed with the FPC.

Vote on Gas Ordinance

A $1 million piped gas system will be installed in Coral Gables if a referendum scheduled to go before voters of the Florida city, Dec. 9, is passed.

The gas ordinance will permit construction on a franchise approved by the commission about six weeks ago with the proviso that the applicants pay for the cost of the referendum and put up a $50,000 performance bond within six months after approval by the voters.

They will also be required to pay the city 6% of the gross revenue from the operation of the system and to begin the work within one year after approval.

Eastern Pennsylvania Line

The Manufacturers Light & Heat Co., Pittsburgh, will build a 125-mile, 14-in. main from near Coatesville, Pa., to the New York state line at Port Jervis, N. Y. Construction of the $5 million line was authorized recently by the Pennsylvania Public Utility Commission.

REGULATION

Winter Deliveries

FPC order establishes emergency service rules for Panhandle Eastern

AN order effective as of Oct. 3, 1947, establishing temporary emergency service rules and regulations to be followed when curtailment of deliveries by Panhandle Eastern Pipe Line Co. is necessary, has been issued by the Federal Power Commission. The rules are to be effective only until new emergency regulations are established, following the conclusion of current hearings in the matter. In any event, these temporary rules are not to be effective beyond Nov. 15, 1947.

Conferences were held between Panhandle, state commissions, the FPC staff, representatives of distributing companies, and others dependent on Panhandle for gas supplies, prior to the opening of the hearings. Purpose of the meetings was to reach agreement on an allocation plan for the 1947-48 winter season, but unanimous approval could not be reached.

The FPC states that the plan it adopted, with modification, has the approval of a majority of the industry committee and is acceptable to a majority of the companies distributing Panhandle gas. It calls for four steps of curtailment:

1. Deliveries to direct interruptible customers of Panhandle and to distributors and pipe line companies purchasing gas from Panhandle under interruptible service rate schedules will be reduced 50%.
2. All interruptible deliveries will be curtailed 100%.
3. Aggregate firm deliveries for other than general service will be reduced by 50%.
4. Deliveries shall not exceed certain specified volumes which Panhandle is obligated to deliver when demanded to meet requirements of general service customers.

The commission stated that Panhan-

Gas Has Got It in Oregon

Introducing "Miss Portland of 1947" at the kick-off meeting of the Gas Appliance Society of Oregon's gas range sales campaign, designed to tie in with the national Gas Has Got It program, is Elmer Calef of Calef Furniture Co., president of the society. Running from Sept. 24 to Dec. 24, the campaign will boost salesmen's earnings and dealers' profits.

Thirteen gas range manufacturers are participating in the contest. Every salesman of dealers or plumbers who handle eligible gas ranges and are members of the society may compete, with the exception of sales forces of Portland Gas & Coke Co.

Top prize is a round trip via luxury airliner from Portland to Mexico City, plus $25 in cash for a stop-over in Los Angeles and 500 pesos in Mexican money. In addition to the grand prize, there will be five awards each consisting of an expense-paid week-end at Timberline Lodge on Mt. Hood.

In connection with the program, the society sponsored a Gas Has Got It week—Oct. 6 to 13. Gas range window and floor displays were urged during this period and mats and layouts were made available. Advertisements coordinated with the national Gas Has Got It ads were also suggested.

dle's daily capacity of 425 MMcf, plus 20 MMcf per day from the Big Inch lines, is expected to fall about 73 MMcf short of meeting estimated firm requirements of Panhandle's customers this winter.

Texas Butane Deliberations

Newly recommended amendments to regulations governing the Texas butane industry are now before the gas utilities division of the Railroad Commission. The recommendations were considered at a meeting of the commission in Austin, Sept. 29.

Alterations in Texas rules were proposed last July, according to S. C. McIntosh, director of the division, in an effort to make existing laws more specific. With more than 300 members of the Texas Butane Dealers Association in attendance, the hearing lasted only one morning.

The attending members, prepared for quick action by three months of consideration of the new amendments, gave unanimous endorsement. The final form of the rules and regulations is expected to be ready within the next 90 days.

Submerged Lands Decision Upheld

The Supreme Court recently upheld its 6-2 decision that the United States has paramount rights over oil-producing lands three miles seaward from the California low watermark. The formal decree defining those rights has not been issued.

The state of California had asked for a rehearing in the case, contending that the decision previously handed down would deprive all coastal states of valuable property rights.

FINANCIAL

July, August Sales Up

Total utility sales in August were up 8.2% over August, 1946, the AGA reported Oct. 1. For the 12-month period ending Aug. 31, 1947, total sales showed an increase of 11.1% over a year earlier. Natural and mixed gas sales increased during the month, 9.2% and 2.8%, respectively, over the same month a year ago. Manufactured gas sales showed a decline of 1.9%.

The Federal Power Commission states that operating revenues of natural gas companies reporting to the commission amounted to $40.9 million in July, an increase of 10.8% over the amount reported for July, 1946. Gas utility operating income was up 21% and operating revenue deductions were up 9.6% over July, 1946. For the year ending July 31, 1947, gas operating revenues totaled $637,723,956, an increase of 15.4% over the previous year.

Total revenues from utility sales in the second quarter of 1947 equaled $333 million, an increase of 18.1% over the same quarter in 1946, according to the AGA.

Control Companies Merged

The merger of Robertshaw Thermostat Co., Youngwood, Pa.; Fulton Syphon Co., Knoxville, Tenn., and Bridgeport Thermostat Co., Bridgeport, Conn., to form the Robertshaw-Fulton Controls Co. was announced recently by John A. Robertshaw, president of the new firm. Formation of this company completes a series of mergers combining five subsidiaries of Reynolds Metals Co. American Thermometer Co., St. Louis, and Grayson Heat Control, Ltd., Lynwood, Calif., are included in addition to the above.

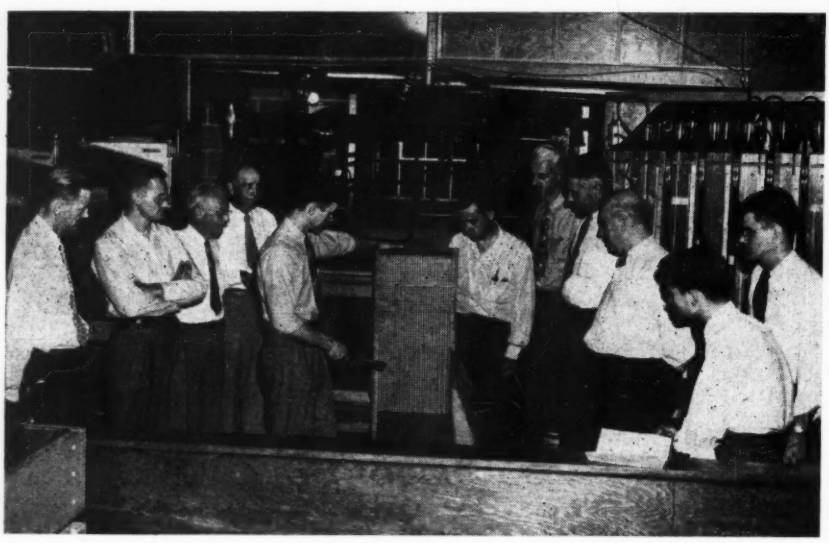
J. A. Robertshaw

Chief officers besides Robertshaw are R. S. Reynolds, chairman; J. V. Geisler, executive vice president; T. T. Arden, executive vice president; R. S. Reynolds, Jr., financial vice president; Walter H. Steffler, secretary and treasurer; and Walter L. Rice, general counsel.

CG&E Asks Rate Increase

The Cincinnati Gas and Electric Co. has asked the Public Utilities Commission of Ohio for a 12 to 15% increase in gas rates. The commission is considering higher permanent rates during an interim period which began five months ago.

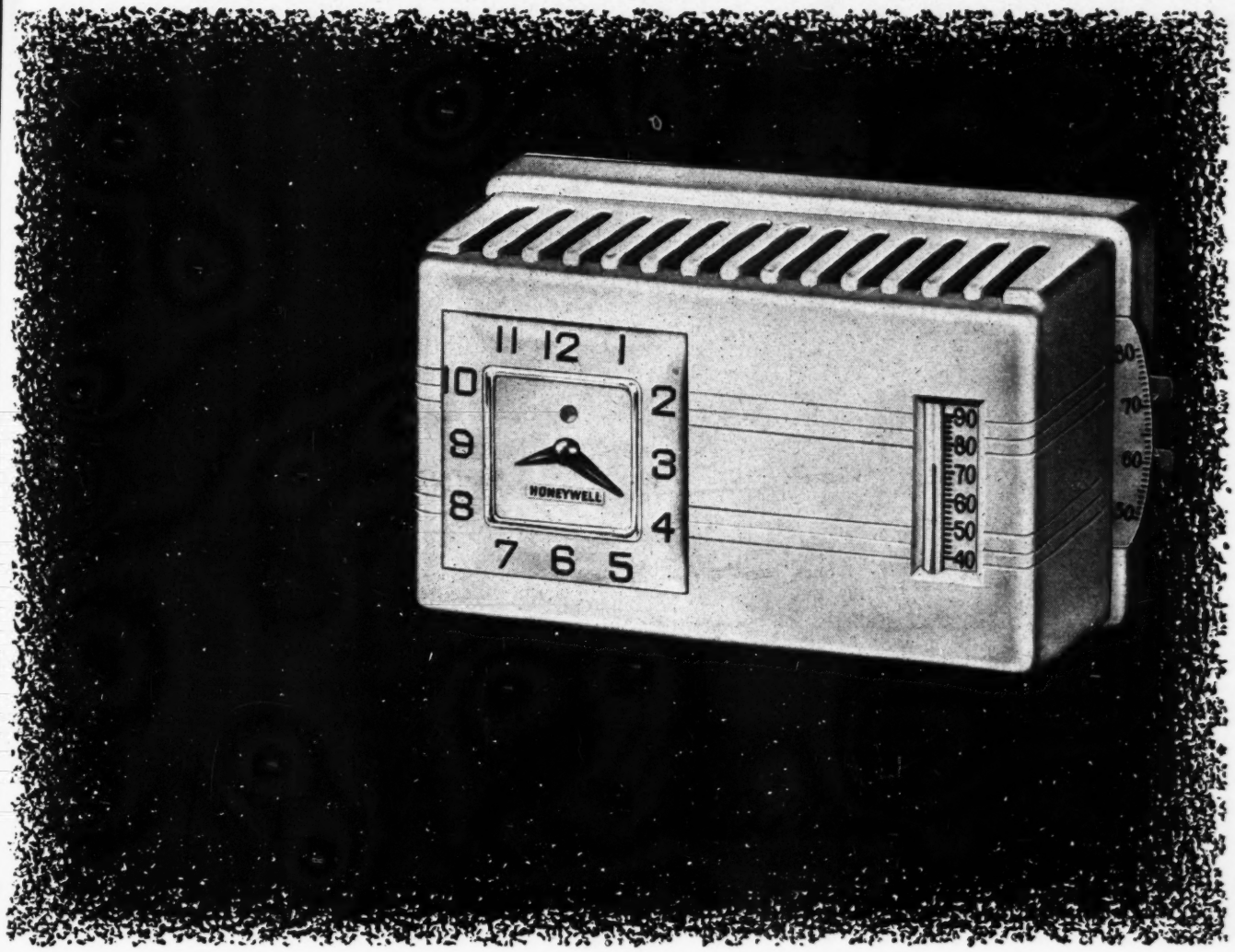
As a basis for establishing increased gas rates, Walter C. Beckjord, president of the gas company, told the commission the company is making preparations to meet anticipated greater demands for gas this winter. Increased costs of labor, coal, and other



Testing Wind Pressure on Model Homes

D. L. Arne of Purdue University's aeronautical engineering department is shown demonstrating to the AGA Technical Advisory Group for Direct Space Heating Research of the Committee on Domestic Gas Research the methods used in taking up to 400 simultaneous readings of wind pressure on different exterior parts of a scale model house (1/24 size). As part of the AGA research in venting gas heaters and other appliances, scale models are tested in Purdue's wind tunnel, where wind speeds up to 60 mph are used. The models are placed in five positions with respect to wind direction.

Shown in the photograph from left to right: C. E. Blome, Purdue Research Foundation; Edmund F. Lorman, Day & Night Mfg. Co., Monrovia, Calif.; E. C. Adams, chairman, Technical Advisory Group; Glenn C. Carnahan, James B. Clow & Sons, Chicago; Arne; William M. Myler, Jr., Surface Combustion Corp., Columbus, Ohio; J. R. Scherrer, Jr., Security Mfg. Co., Kansas City, Mo.; W. A. Stuckey, The Moore Corp., Joliet, Ill.; Eugene D. Milener, AGA; Paul White and Sam C. Hite, Purdue.



HERE'S A PRODUCT you can sell to every user of automatic heat—right now. There is a tremendous market for the new Honeywell Chronotherm as a replacement item because it *saves fuel and will pay for itself over and over again.* And today, more than ever, your customers will welcome every opportunity to cut down their fuel requirements.

Check these ten outstanding

DESIGN FEATURES

1. Simplicity of overall design. No troublesome intricate mechanisms. Exceptionally compact.
2. New bimetcl element . . . assures more accurate temperature control, yet sturdy and dependable.
3. Fingertip external adjustment for day-night temperature settings.
4. Gradual morning pickup insures accurate temperature being restored to the daytime setting without overshooting.
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6. External fingertip wheel for setting clock . . . hands may be set as easily as a watch.
7. Low speed clock motor . . . the ultimate in quiet, accurate clock operation.
8. Clock motor provides 30 times more power than required.
9. Easily removable clock assures ready means of replacement.
10. Separable wall plate for easy mounting.

But the new Chronotherm is more than a replacement item. New homes—new buildings—conversion jobs on existing homes and buildings—all demand the new Chronotherm. What's more, the new Chronotherm offers you *THREE TIMES* the usual profit of a manual thermostat sale. These, in a nutshell, are the reasons why Chronotherm is the natural sales leader of the year. Actually, the new Chronotherm has everything—from both a sales and a performance appeal.

Cash in to the limit on this timely opportunity. Already powerful national advertising is at work creating new interest and building acceptance. A complete merchandising plan is ready to help you follow through. Minneapolis-Honeywell, Minneapolis 8, Minnesota. In Canada: Toronto 12, Ontario.

ORDER YOUR SALES AND DISPLAY HELP *Today*

MINNEAPOLIS **Honeywell**

CONTROL SYSTEMS

materials, and the decreasing purchasing power of the dollar were also offered by Beckjord as reasons for increasing rates.

Coke Business Sold

The wholesale and retail coke business of the Central New York Power Corp. has been sold to United Eastern Coal Sales Corp., and the combined company is called the United Eastern Corp. After Sept. 1 all Niagara Hudson coke, produced at the power company's Utica plant in the manufacture of fuel gas and sold in the Utica-Rome, N. Y., area, was to be handled by United Eastern.

GAS PRODUCTION

Indiana Land Leased

Fred Hargraves, who for several years has been engaged in large scale oil and gas operations in western states, has leased several hundred acres of land in the vicinity of Noblesville, Ind., in Fall Creek township, Hamilton county, for drilling for oil and natural gas. Natural gas is a prime objective because of its increasing scarcity in Indiana during the cold months.

Many wells were sunk in this area 25 years ago and at one time the general central Indiana territory produced large quantities of natural gas. This played out shortly after the turn of the century and was never seriously explored after that era. Attention again is being directed to this once rich natural gas area as a possible producer of natural gas and oil.

Gas Flows From Water Hole

A strong flow of natural gas from a 115-ft. hole being drilled for water southwest of Whiteland, Johnson county, Ind., recently brought speculation on the possible extent of the gas field in the area. George Close, veteran drilling contractor of Whiteland, is in charge of the well, from which gas shot up to 50 ft. and finally ignited.

The gas flow is the strongest encountered in that section of Indiana during his 25 years of drilling experience, according to Close. Small private gas wells used for home consumption have been operating for years in this section of the state.

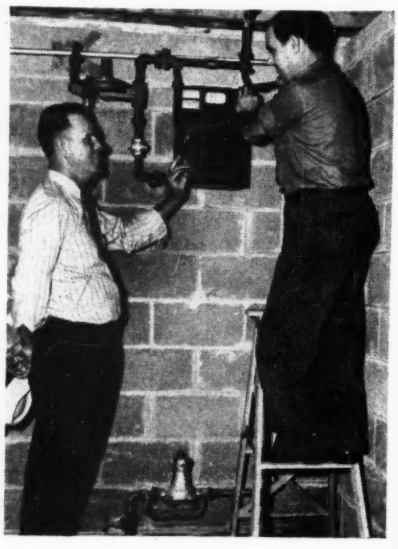
Canadian Field Discovered

About 3.5 MMcf of natural gas daily will be available to the Union Gas Co., Chatham, Ont., this winter from a new gas field at Becher, Ont. The field was discovered and developed by the Imperial Oil Co. of Canada, a Standard Oil subsidiary. As soon as possible, a Union transmission line will be connected with the Becher wells, which have an open flow capacity of 14 MMcf per day.

Republic Natural Explores

The development program carried out by Republic Natural Gas Co. during the year ended June 30 was the most extensive in its history. A total of 104 wells were drilled and two gas wells purchased. Of the wells drilled, 76 were gas wells, 22, including three partnership wells, were oil producers, and six, including one partnership well, were dry holes.

The program also included acquisition of a substantial amount of prospective oil and gas acreage. Exploration efforts have been supplemented by geophysical surveys. A district geological and land office was opened in Oklahoma City to supervise acquisition and exploration of oil properties in Oklahoma, where some 8000 acres of prospective oil and gas lands were acquired during the year.



Meters Multiply

Virgil Reichard, customer service foreman, Citizens Gas and Coke Utility, Indianapolis, looks on as Odia Boston, customer service specialist, turns the last valve on the 116,000th meter installed by the company. This all-time high represents a 50% increase in meters since Citizens Gas and Coke took over operation of the gas utility for the city in 1935. In that year 876 miles of gas mains served Indianapolis and Marion county, but today there are 1233 miles of mains reaching many outlying communities.

Three New Indiana Wells

A new source of natural gas in Indiana has been uncovered in Hamilton county north of Indianapolis, near Westfield and Noblesville. Three wells have been struck with an estimated total of 3 MMcf of gas every 24 hours, reportedly enough to heat 1000 to 1500 homes.

Gulf Coast Acreage

Tennessee Gas Transmission Co. through a subsidiary, the Coast Co., has purchased gas-producing acreage on the Gulf Coast, marking the first move of importance by the company in entering the producing field. Coast Co. was formed in March of this year. Financing is contemplated for this fall to replace bank loans and is expected to take the form of new debt securities.

Large Texas Oil Pool

Phillips Petroleum Co. has discovered an oil pool, located midway between the Goldsmith and Andector pools, which is believed to be the largest pool found in West Texas this year. The company's No. 1 McEntire has been taken down 8500 ft. and has penetrated 502 ft. of oil sand, showing 110 bbls. an hour on drill stem test.

MISCELLANY

Short Wave System

A short-wave radio network with a five-state area will provide added natural gas service for customers of the Manufacturers Light & Heat Co. in the Columbia Gas system. The Pittsburgh group of affiliated gas companies will invest $200,000 on the new network.

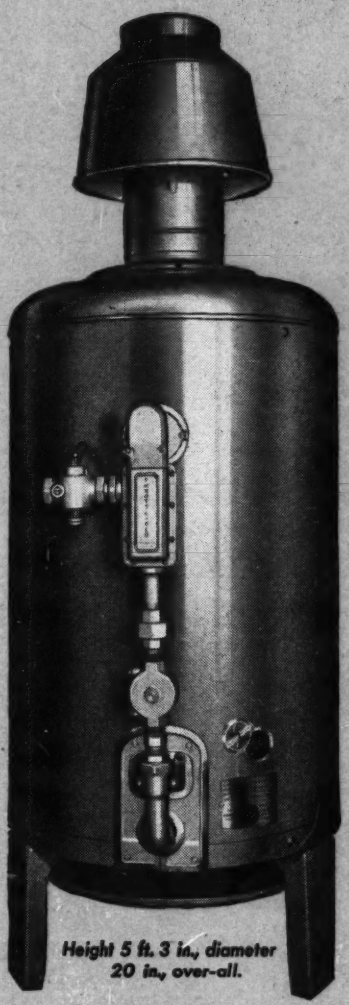
Application has been made with the Federal Communications Commission for construction permits to establish short wave sending and receiving stations.

Plans call for immediate construction of an initial group of transmitters. Emergency radio communication by the gas company will be on a requested assignment of 33.34 megacycles, in the 30-40 megacycle channel of frequency modulation reserved for power-utility services.

The radio network will be employed to improve the dispatching control, and operation activities related to more than 10,000 miles of natural gas production and transmission lines operated by the affiliated companies.

Major use of radio communication will be to link the offices of field superintendents and their scattered work crews in times of emergencies. At

This one gas water heater gives you...



Height 5 ft. 3 in., diameter 20 in., over-all.

180° STERILIZING WATER

140° GENERAL-PURPOSE WATER

From one system, at the same time, you can draw water at two different pre-selected temperatures. Yet it costs less to install and less to operate!

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VOLUME-FLOW WATER HEATER

The revolutionary new SMITH*way*-BURKAY Patented Booster-Recovery System supplies all the 180° sterilizing hot water required for efficient operation of your dishwashing equipment—*hot enough to meet all health and sanitation codes.*

At the same time, it also gives you an ample supply of general-purpose hot water at moderate temperatures for your kitchen and lavatories.

The exclusive Throttl-Flo Thermostat automatically varies the gas flow in proportion to the rate of water flow through the heater.

This improved gas water heater, the result of extended war-time research, maintains sterilizing temperatures within 2°, takes little space, and will pay for itself in operation savings.

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present there is no way for supervisors quickly to communicate with crews at work in outlying areas, nor for such gangs to communicate with gas company offices and shops.

The tentative plan of the affiliated companies in the Pittsburgh group is to establish in 1947 a few fixed and mobile units in western Pennsylvania. As these swing into operation, new units will be added during succeeding years. By 1951, an emergency radio communication system should adequately cover the various gas company territories in Pennsylvaia, Ohio, New York, West Virginia, and Maryland.

Pipe For Storage Units

The same type of pipe being used in laying the "Biggest Inch" line from Texas to California is being employed in a new type of gas storage unit developed by Consolidated Steel Corp., to be installed underground by Southern Counties Gas Co. at San Luis Obispo and Paso Robles, Calif.

Each unit will be of about 25 MMcf capacity, with a working pressure of 440 psi. The San Luis Obispo unit will consist of 7 tanks, 30-in. O.D. by 240 ft. long, and the Paso Robles unit of 9 tanks, 30-in. O.D. by 180 ft. long. All tanks will be fashioned from 60-ft. sections of Consolidated's high-strength pipe welded together at the site. The tanks will be laid parallel underground and manifolded together.

Consolidated claims that the expanded pipe is particularly suited to this service, because in the manufacturing process it is stretched circumferentially by internal hydraulic pressure, thus increasing the circumferential yield strength of the pipe and also proving the longitudinal welded seam to be as strong as the parent steel plate.

Radio Cooperation

Gas and pipe line companies contemplating the use of radio or now using radio in their system operations may now get in touch with associated Regional Coordinating Groups either organized or in the process of organization in all sections of the country, it was reported at a recent meeting of the Power Utilities Radio Communications Commission.

Atlantic City in '48

Scene of the 30th annual convention of the AGA will shift back to Atlantic City, N. J., site of the 1946 affair. The recommendations of the Time and Place Committee, headed by Alfred Hirsh of St. Louis, were ratified at the concluding general session at Cleveland.

The dates—week of Oct. 4.

The organization of regional groups has been fostered by the Power Utilities Radio Communication Systems Committee to establish close cooperation among all licensees of utility radio systems. It is the function of these regional groups to promote this cooperation in various areas on such matters as the selection of operating frequencies so as to avoid interference.

It is understood the FCC will request each future applicant for a license to operate on a power utility frequency to secure a recommendation from the appropriate Regional Coordinating Group as to the specific frequency which should be used. Companies now using radio will find such contact worth while to permit a shift from their present temporary frequency to a new one.

W. T. Bulla, Natural Gas Pipeline Co. of America, 20 N. Wacker Dr., Chicago 6, is the AGA representative on the Power Utilities Radio Communications Commission.

Liquefied Coal

A pilot plant to experiment with a German method of liquefying coal is being planned by the Pittsburgh Consolidation Coal Co. and the Standard Oil Co. of New Jersey. In Germany during 1939 this process gave 52% gasoline, 26% diesel oil, 9% wax, and 13% gas.

Establishment of this and other coal liquefaction and gassing plants with vast new industries by the year 2000 was predicted in a recent speech by C. A. Powell, Westinghouse Electric Corp., before members of the Rocky Mountain Electrical League. Powell stated that present sources of power such as coal, oil and gas are being consumed much faster than they are being created. World reserves of coal, he said, are good for at least 1000 years. Immense processing plants, each capable of handling 10 million tons of coal a year and each costing $100 to $150 million will be required to process over 1800 million tons of coal a year, half of which will be necessary to make up the deficiency of gasoline and natural gas by the year 2000.

Synthetic Gasoline Process

The cost of synthetic gasoline made by a new technique may be cut sufficiently to permit competition with natural gasoline, according to a report from the Pittsburgh headquarters of the U. S. Bureau of Mines.

In a paper read to the American Institute of Chemical Engineers, northeast regional meeting, Max Leva explained that hydrogen and carbon monoxide gases are passed through the bottom of a catalyst to cause the violent agitation called "fluidization." The passing of these gases throught the catalytic material causes the combination between hydrogen and carbon monoxide to form gasoline and similar products, Leva said.

Annual Report Award

Formal presentation of the bronze "Oscar of Industry" trophy was made to Black, Sivalls and Bryson, Inc., at the Annual Report Awards banquet held in the Hotel Pennsylvania, New York, Oct. 10.

Arthur J. Smith, president of the company, accepted the trophy, awarded to BS&B for its 1946 annual report, which was judged the best of the Materials Handling Equipment Industry by the independent board of judges in the Financial World Annual Report survey.

Steel for Pipe Assured

Adequate pipe for the proposed Michigan-Wisconsin Pipe Line Co. line was virtually assured with the announcement by J. A. B. Lovett, president, Milwaukee Solvay Coke Co., that his firm will sell more domestic coke in the Wisconsin market. The coke will be shipped to steel mills, although some will be supplied to foundry customers. Milwaukee Solvay is the only manufacturer of domestic coke in the city.

Tulsa Appliance Exhibit

The "appliance midway" at the Tulsa State Fair, Sept. 14-20, was installed by the recently organized Tulsa Appliance Dealers Association in cooperation with the Oklahoma Natural Gas Co. and the Public Service Co.

Both utilities loaned their home service departments for "live" demonstrations in the exhibits.

Flame Family Displays

Sets of five Flame Family window display statuettes, 10 in. high, finished in blue, red, black, gray and cream and complete with metal staffs to hold advertising message, sign or price tag are being manufactured by Tony Studios of San Diego and distributed by the Knollin Advertising agency of San Francisco. The statuettes are being manufactured and copyrighted for the Pacific Coast Gas Association, originator of the Flame Family. The five figures are named Speedy, Flexy, Steady, Cleany and Thrifty Gas Flame. A set of five costs $9.50 plus tax, packing and shipping.

Millions of Ads Like This Sell the UNIVERSAL GAS RANGE for You!

at church or on a holiday
dinner cooks while you're away
IN A NEW automatic UNIVERSAL GAS RANGE
Beyond the city mains, Universal Gas Ranges are especially designed for use with "L-P" (tank or bottled) gas.
...and when the family returns, ah! tender, golden-brown turkey . . . oozing savory juices, ready to tempt even the dullest appetite . . . thanks to your Universal Gas Range with an oven, big enough to cook a 25-pound turkey.
Perfect results are assured . . . because the Universal Gas Range does your cooking accurately, automatically! Just set the Universal automatic clock — and your cooking problems are solved.
In addition to automatic cooking, the Universal Gas Range has dozens of other time and work-saving features. And, too, GAS is the cleanest, fastest, most economical fuel in the world. Gas has got it! Stop in at your dealer or gas utility to see the complete line of Universal Gas Ranges.
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For 76 years the Universal selection of cooking perfection.
Guaranteed by Good Housekeeping

...**Because** they tell the UNIVERSAL Gas Range story the year 'round in every field.

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UNIVERSAL PERFORMANCE PROVES GAS HAS GOT IT

3. QUALITY CONTROL

The final phase of administration is to obtain factual verification that the mechanics of service are performed correctly from the point of view of utility service policy and customer satisfaction. The method of obtaining this information is identified by technicians as "Quality Control." This discussion of Quality Control is the third part of a paper, entitled "The Use of Technology in Customer Service Administration," which appeared under C. A. Renz' byline in the October issue of GAS.

By C. A. RENZ

Mgr., Customer Service Dept.
Southern Calif. Gas Co.

THE use of statistical quality control is becoming increasingly acceptable in the manufacturing industry as a valuable production tool. Its application in the field of personal services is less widespread, but the administrative problems of organizations engaged in both the fields of goods and services are sufficiently parallel to make certain phases of statistical quality control useful in managing either type of business.

The routines of the Quality Control section of the Southern California Gas Co.'s customer service department are based on data obtained through field inspection of servicemen's work in customers' homes.

Trained service inspectors call at selected addresses following the serviceman's call. The inspection of equipment on the premises is crystallized into a set routine based on the company's service policy. The tolerances of acceptable work defined in the inspector's manual were empirically established on the basis of field observations and existing practices, but are uniformly applied.[1] Inspectors report their findings in a standardized manner requiring a minimum of written explanation, and the data gathered in this manner are processed through statistical means into report form. The mathematics used in refining the information was check by the industrial engineering firm, Production Management Engineers Associated, Inc., and found to be sound.

[1] "Quality Control Organization" by J. A. Weber, Proceedings of the Pacific Coast Gas Association, Page 116, Vol. 35, 1944.

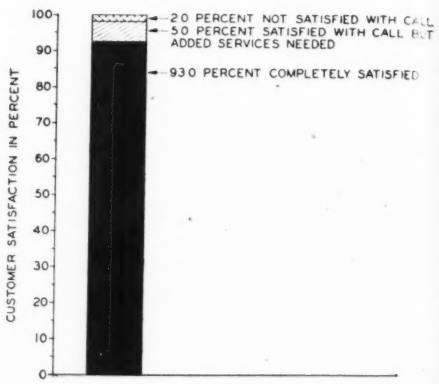


Fig. 1. The need for Quality Control is shown by this Southern California Gas Co. survey. Although 93% of customers were satisfied with service calls, 5% felt that they needed added service and 2% were dissatisfied.

The objectives of the Quality Control section are threefold:

1. To supply pertinent information useful in planning revisions of policy and to test the practicality of new instructions by determining if they are uniformly understood and applied by field personnel.
2. To gather information relative to the performance of new servicemen for use by the customer service department training staff and line supervisors.
3. To maintain individual records of servicemen's performance for purposes of personnel control.

Policy Studies

The major objective of gas utility service organizations is, of course, to promote the use of gas burning equipment by increasing customer satisfaction with their existing appliances. Service policies are established with that objective in mind, but often little is known about the real effectiveness of a given policy as applied by field personnel. Aggravated cases of customer dissatisfaction are brought to light through formal complaints to the company or by repeated call-back orders, but the larger volume of minor items that often go unnoticed are important points to consider in judging the value of a policy. Work inspection in the customer's home supplies facts

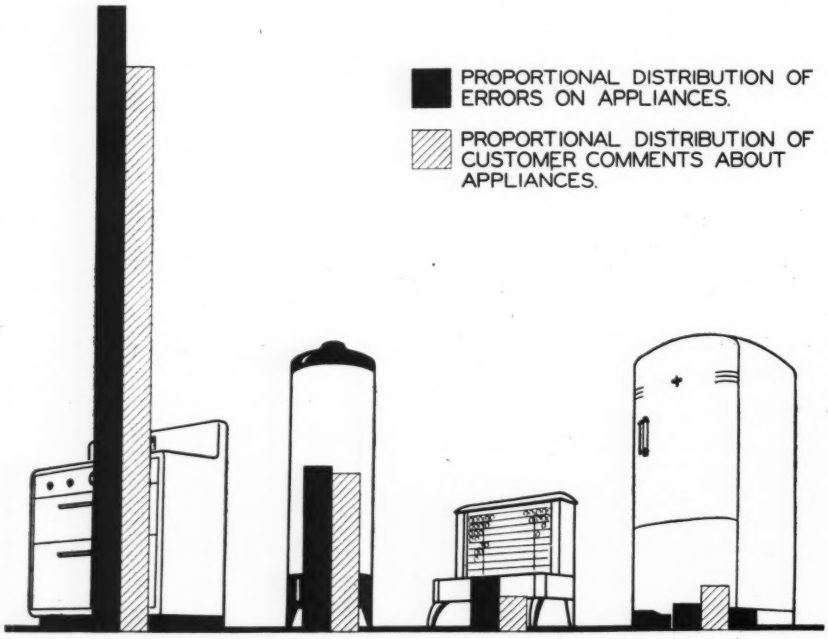

PROPORTIONAL DISTRIBUTION OF ERRORS ON APPLIANCES.
PROPORTIONAL DISTRIBUTION OF CUSTOMER COMMENTS ABOUT APPLIANCES.

Fig. 2. The correlation between proportional distribution of service errors made on appliances and the proportional distribution of customer comments made about appliances is demonstrated on four big jobs—cooking, water heating, space heating, and refrigeration.

Fig. 3. The study illustrated here reveals that the range top is the section requiring the most attention, with top burners and the pilot being the focal point of trouble.

that cannot be obtained by other means.

As an example of this activity, 3690 completed orders arising out of customers' requests for service were studied. Those data *(see Fig. 1)* disclosed that 93% of the customers contacted were completely satisfied with the services rendered. An additional 5% of the customers were satisfied with the treatment given the appliances prompting their requests for service. However, comments made in these cases indicated that the service could have been improved had the servicemen completely adjusted all other appliances.

The next step, obviously, is to break down the data still further to determine which items are responsible for that lack of complete customer satisfaction on the part of the 7% of the customers contacted. For a number of years we have known that the number of field errors has been disproportionately high on ranges. *(Fig. 2)* It appears significant that percentagewise, the customers' comments about appliances following a service call correspond quite closely to the overall error frequency pattern. This close correlation between customers' comments and the field error frequency indicates that the inspection routine is a valid index of both customer satisfaction and the degree of individual adherence to policy.

The segregation of the items inspected on the various pieces of equipment makes it possible to determine within close limits the particular section of the appliance that is contributing to the problem. An examination of the customer comment shows the range to be the major source of complaint.

A study of the mal-adjustments resulting in questionable customer satisfaction regarding the range *(Fig. 3)* reveals that the range top is the section requiring closest attention with the top burners and pilot being the focal point of trouble, accounting for 41% of the cases of mal-adjustment resulting in questionable customer satisfaction. The value of this type of information in establishing a service policy is apparent.

To cite a recent example, a radical change of policy relating to the inspection and adjustment of appliance pilots was being seriously considered on the basis that the existing policy and inspection tolerances focused an unreasonable amount of attention on pilot adjustments. The inspection data portrayed in *Fig. 3* did not support that view. A change was made, however, based on the above study, requiring closer inspection of pilots but giving the serviceman more latitude in making an adjustment that would operate most effectively. The resulting policy specifies that all pilots are to be inspected and cleaned on each call. The serviceman may adjust the flame to burn blue or yellow, depending upon the operating characteristics of the ignition system, providing impingement, odors, sooting, etc. are not involved.

This process of looking at our mistakes through the customers' eyes is one of the major factors resulting in nine changes in the service policy and numerous changes of minor operating procedures during the past two years. Without work inspection many needed revisions would have gone unnoticed and the other necessary moves would have been based to a great extent on opinion alone. Information of this type was particularly helpful in planning restricted wartime service policies to meet the manpower shortage. Reductions in service were based on data showing which items least affected customer satisfaction and safety.

An important function of the Quality Control section is to furnish data useful in promoting effective training of new employees and adequate follow-up-on-the-job instruction by supervisors. This activity is particularly important at the present time. Our plans for 1947 include adding a hundred new servicemen to the organization and upgrading approximately 70 men to more responsible jobs. Well integrated activity on the part of the training staff, line supervisors and the Quality Control section will be necessary to make such an ambitious expansion program successful.

Evaluating Training Results

A large sample of newly assigned servicemen's work is inspected during the probationary period extending over the first six months of employment. Those data are usually summarized into four separate reports indicating the progress of each man during the period. Copies of those studies are issued to the training staff as well as line supervisors. The training staff is obviously most interested in the early performance of the recently trained employee as an index of the effectiveness of training. The strong or weak points in course material can be determined with considerable accuracy, and appropriate revisions specifically tailored to known needs can be made.

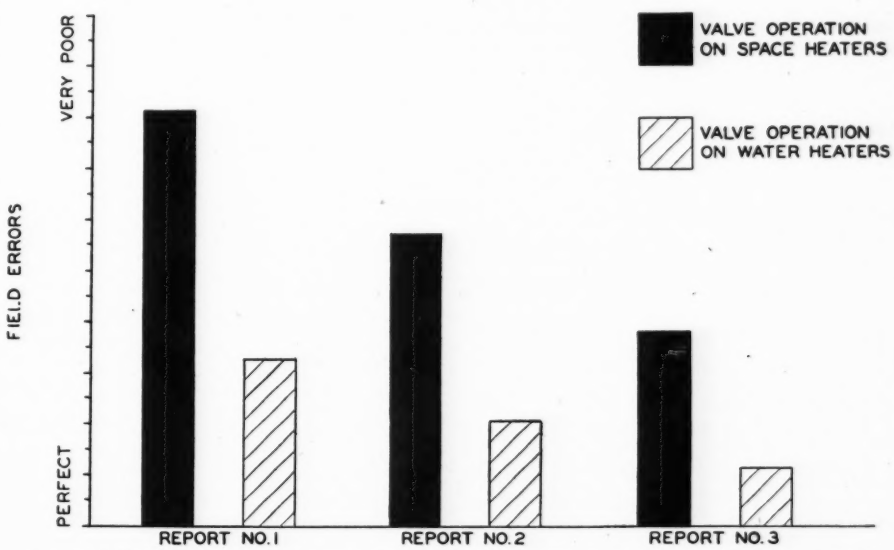
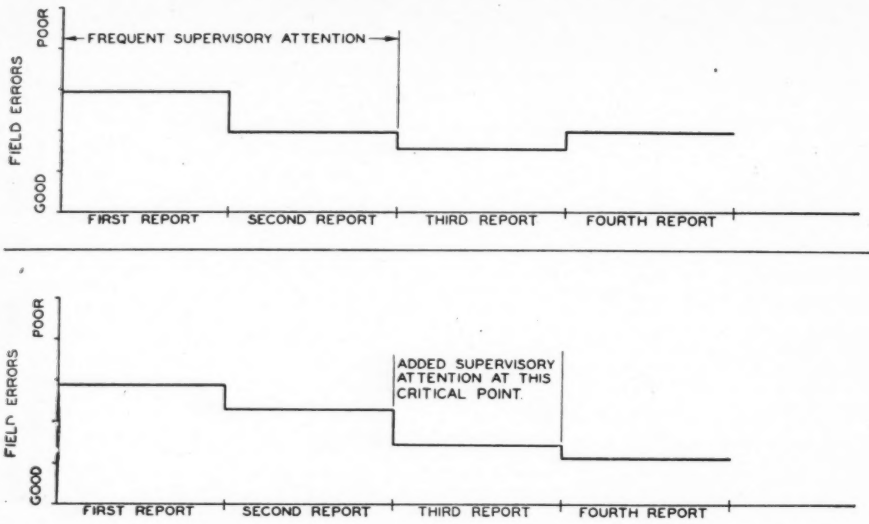


Fig. 4. A breakdown of field errors made by servicemen indicates a need for additional attention to valves, particularly on space heaters and to a lesser degree on water heaters. Those points were emphasized in training courses for new servicemen, resulting in improved performance on successive reports.



Figs. 5-6. Under Quality Control, the progress pattern of all new employees is plotted for the purpose of determining general trends. The first of the two charts above, Fig. 5, shows that field error frequency increases during the last part of unsupervised probationary periods for servicemen. When early training is supervised, however, better results were achieved as demonstrated in Fig. 6, the second of the charts.

For example, the break-down of field errors made by new servicemen indicated a need for additional attention to valves, particularly on space heaters and to a lesser degree on water heaters. Those points were emphasized in the training course resulting in the decrease of errors in the following three summaries as shown in *Fig. 4.*

It is a well known fact that an extensive training program is costly. Quality Control promotes effective use of training funds and may be the "objective measurement of training results" for which training directors have been seeking to evaluate their activities.

First line supervisors who are responsible for post-training instruction and who must decide whether or not a new man should be retained as a permanent employee rely on the Quality Control section for considerable information.

Progression Rate

By centralizing inspection data, it is possible for the progress pattern of all new people to be plotted for the purpose of determining general trends; the plot also serves as a bench-mark for judging the progress of each serviceman.

Individual foremen observing the performance of a few new men are often not in a position to see the overall picture and plan their follow-up instruction accordingly. For a period of approximately three months the progress chart of new servicemen as a whole was showing an increase in the field error frequency during the last part of the probationary periods. *(See Fig. 5.)* A study of supervisors' reports disclosed that the relatively good performance during the second and third periods could be attributed to frequent field training by foremen during the early part of the new man's assignment. This situation was called to the attention of supervisors and it was suggested that the foremen may achieve better results by spreading their field instruction over a wider period of time. That suggestion was followed, and during the next three months the progress pattern continued the normal trend *(see Fig. 6)* throughout the probationary period.

The demands made on a foreman require him to make maximum use of the time he has available for field instruction. The progress reports of the individual new men are helpful to the foremen in that respect by indicating the specific needs of each man. The type of error noted in the work sample may indicate that only an office discussion is needed to correct the matter. On the other hand it may be necessary for the foreman to arrange for the man to be given a specific type of work order assignment and spend a considerable amount of time with him in the field to correct a weakness. This case history *(see Fig. 7)* taken from our files shows the progress that can be made when the foreman is properly supplied with facts and uses them effectively.

When first assigned to the job, this man was obviously attempting to work faster than his knowledge and experience would support. His production was abnormally high resulting in excessive field errors. A study of these errors showed that they did not show any pattern but were scattered throughout all phases of the work. In his first field ride the foreman was able to slow the man down and offer a few points of advice.

The second report indicated some improvement and a slight pattern of errors was detectable. The production index had dropped but was still substantially above average. On the second and third field rides, the foreman was able to correct the man's faulty work habits resulting in continued improvement in his field performance.

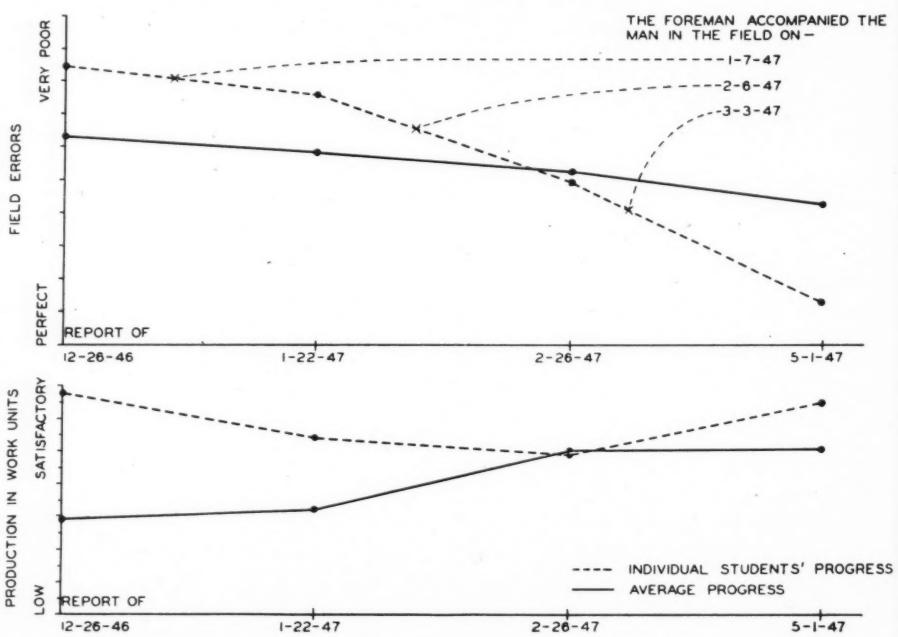
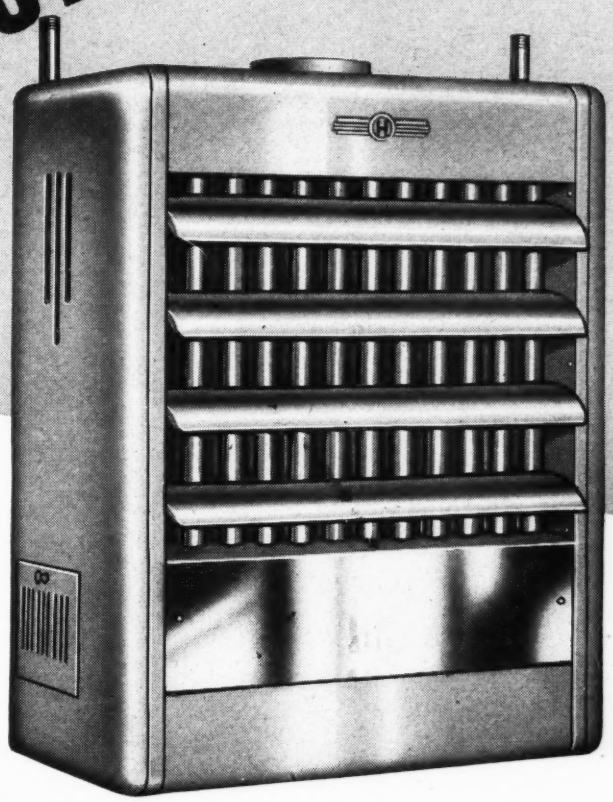


Fig. 7. The effect of foremen spending a considerable amount of time on the job with new men is revealed by these illustrations. In the chart above, periodic checks by the foreman reduced the serviceman's errors below average. The second of the charts indicates that active supervision temporarily reduced work units accomplished, but that the rate was soon re-established with an accompanying decrease in field errors.

HUMPHREY GAS UNIT HEATERS



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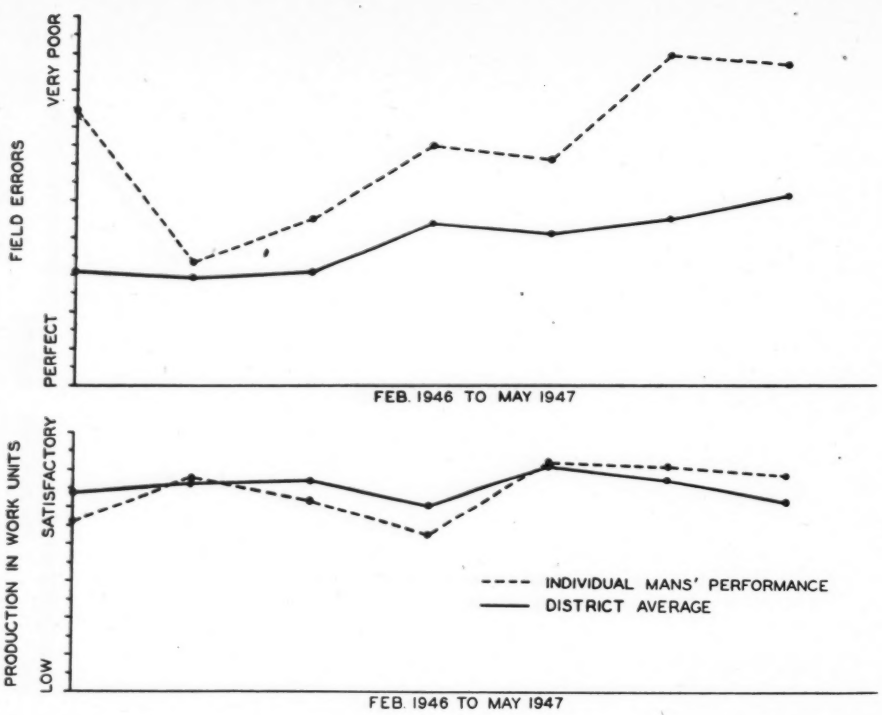


Fig. 8. Excessive errors by new servicemen are detected by Quality Control. The employee whose record is shown in the first of these two charts was dismissed after a training check by the foreman failed to improve his field error rate. The second chart also shows that the new man's production in work units was below average.

After four months the foreman had been successful in reducing the man's field error frequency to a lower than average point and re-establishing his production rate at a higher than average level.

Screening

On the other hand it is occasionally necessary for a foreman to release a new employee before the expiration of the probationary period. Again, the general progress pattern, based on a large number of cases, is useful to the foreman in reaching that decision.

In fairness to both the employee and the company it is our policy to terminate obviously misfit persons at the earliest possible date. The responsibility for the decision rests solely on the foreman, but it is the responsibility of the Quality Control section to call the foreman's attention to extreme cases as soon as possible. For example, the foreman in charge of this man *(see Fig. 8)* was contacted before the first work sample was complete because of the excessive number of field errors observed. The foreman immediately started corrective work but was unable to bring the man's performance up to standard.

With follow-up training by foremen and close coordination between the foremen and Quality Control, it is our belief that the present method of screening of new employees is both fair to the new employee and effective from the management viewpoint.

It is properly a function of Quality Control to establish and maintain work performance records of all servicemen which can be used for the purpose of personnel control.

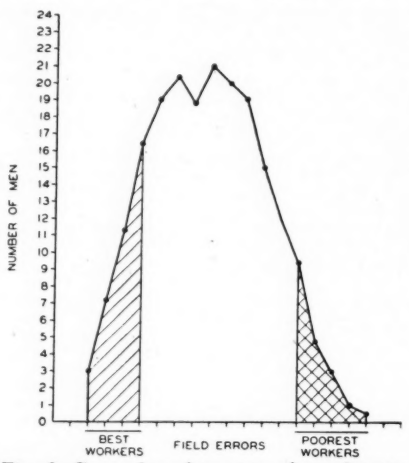


Fig. 9. General performance of servicemen as a group is described in the above curve. Field instruction by foremen or a brief refresher course by the training staff is all that is needed to restore performance to a satisfactory level.

This activity is intended to serve two purposes:

1. The record should show which individuals are in need of corrective attention and support disciplinary action with facts when a dismissal is warranted on the basis of poor workmanship.
2. At the opposite extreme, superior performance should be clearly indicated to show which individuals have earned the opportunity for promotion.

The general performance of servicemen as a group from the standpoint of field errors is described in the curve shown in *Fig. 9*. The group falling in the higher error frequency bracket are the men who by comparison are doing the poorest quality of work. In the large majority of those cases, field instruction by the foreman or a brief refresher course by the training staff is all that is required to improve the man's performance to a satisfactory level.

In those instances where disciplinary action is necessary it is customary for such action to be initiated by the first line supervisor who requests the assistance of the Quality Control section in compiling the required supporting data.

The complete case must show that (1) the man has the poorest performance record in his work group and is significantly below average, (2) his poor performance is the result of his not following properly given instructions that are observed by other workmen, (3) he has been given adequate instruction and ample opportunity to overcome his weaknesses, and (4) the necessary formal notices, interviews, and time limits specified by labor and management negotiations have been observed.

The chart in *Fig. 10*, taken from a recent case, is typical of the type of performance which requires disciplinary action. Here, the man voluntarily resigned before the end of his last "grace" period. Resignations by unsatisfactory employees are not uncommon, when the man is confronted with the facts of the case. It is rather significant that during the last 3½ years of unsettled labor-management relations not a single case of dismissal based on Quality Control records has been formally protested by the employee or his representatives.

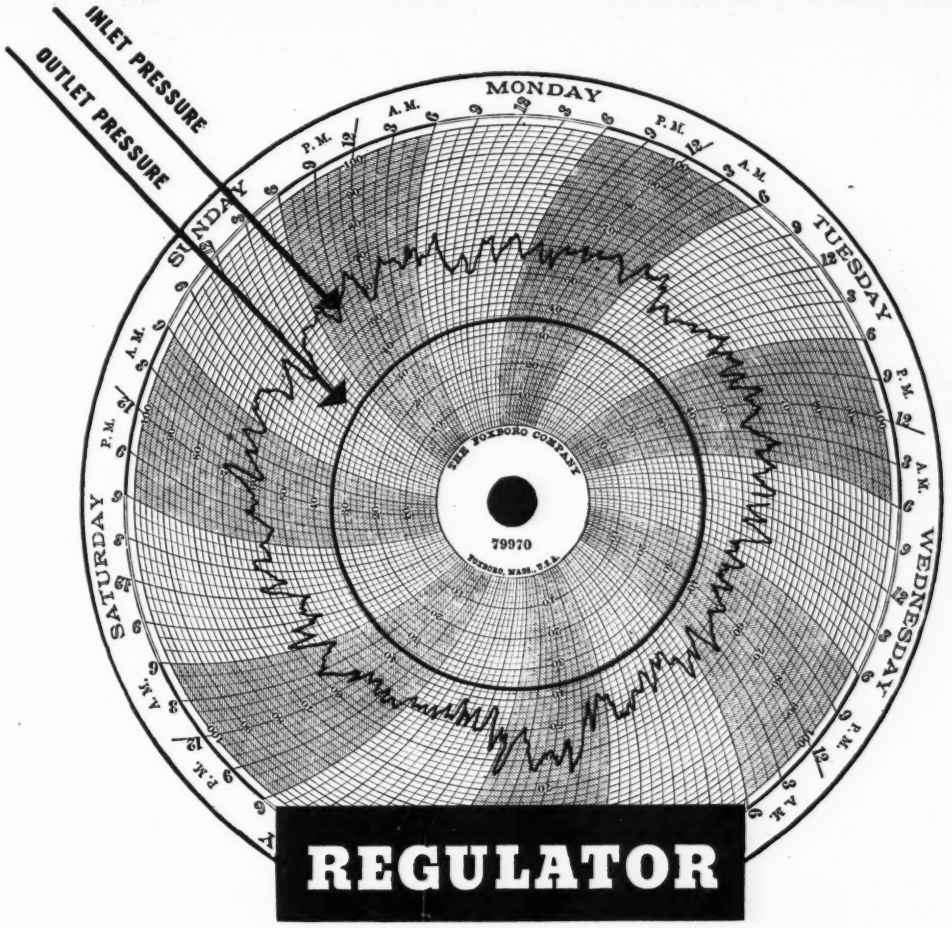
Promotional Selection

Promotions fall into one of two general types depending upon whether or not the job to be filled is classified as being within the scope of the labor-management agreement.

The contract between the company and the union is specific in covering promotions in the job classifications subject to union representation. That procedure specifies that seniority shall be the major factor in promotions granting that the candidates have sufficient qualifications for the job. The burden of proving sub-standard work in the present classification rests with management and must be substantiated with facts.

Individual performance records based on Quality Control data have made it possible for management to justify its actions in denving unsound promotions in job classifications covered by the contract and thus main-

LOOK AT THIS STORY ON A PRESSURE CURVE CHART



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It is, in short, a recording of the results obtained by companies everywhere with the use of SENSITROL.

SENSITROL, an auxiliary pilot loading system for gas pressure regulators, is a new and improved application of the well known pressure loading principle of regulator operation.

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Service is dependable, uninterrupted. In case of pilot pressure failure or accident to the loading unit, the main regulator neither closes to interrupt service nor opens wide to create a hazard. In this event the SENSITROL becomes inoperative and the main regulator diaphragm takes over complete control of reduced pressure.

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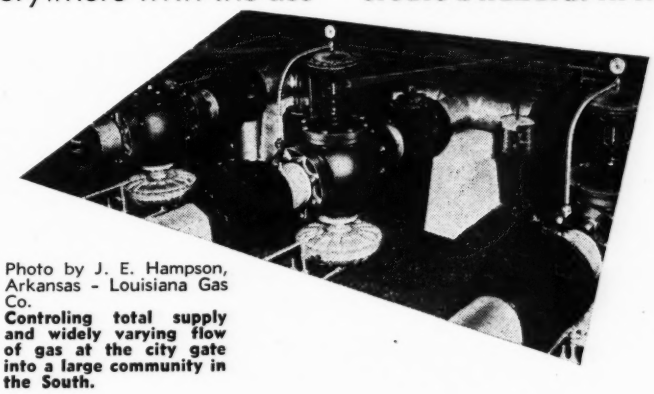

Photo by J. E. Hampson, Arkansas - Louisiana Gas Co.
Controling total supply and widely varying flow of gas at the city gate into a large community in the South.

THE CHAPLIN-FULTON MANUFACTURING CO. PITTSBURGH 22, PA.

tain a greater degree of control than would have been possible without field inspection of service orders.

In the non-subject groups it is the foreman's responsibility to recommend the individuals to be considered for promotion. The foreman's recommendation is based on his opinion of the man's integrity, acceptance by his fellow workmen, and other qualities of leadership as well as his special qualifications for the job ahead. It is then the responsibility of the Quality Control section to determine which candidates are the most serious contenders for the job. The first criterion specifies that a candidate must have a two-year work record that places him in the top 40% of the group. The remaining candidates are then listed in rank order on the basis of their foremen's ratings for previous years of service. It is in this last important step that seniority becomes significant because a man with an extended good record will out-rank a man with a similar record but less seniority. Conversely, a man with an exceptional record but less seniority may out-rank an older employee with a mediocre record.

It is evident that the foreman is the key man in this selection procedure. The important first and last steps are based on information that can only be supplied by the first line supervisors. The Quality Control section only keeps the record and injects the department-wide viewpoint. This routine has been followed with good results in a variety of promotions where the candidates were upgraded from the ranks.

The new service inspectors promoted on this basis have worked out well in their new jobs, but more important is the fact that their selection for the job appears to have the approval of their former colleagues whose work they now inspect. In addition, it has given foremen a greater degree of control over promotions from their groups. Such action is consistent with the trend in many companies of giving the foreman greater latitude in his job in an effort to make first line supervisors increasingly conscious of their management responsibilities.

Besides these primary functions of Quality Control, there are other possible applications with little or no additional cost. A good example is a project currently in process wherein we are attempting to ascertain the degree of customer's acceptance of some of the broader aspects of our policy. This activity is still definitely in the experimental stage and cannot be completely treated at this time but to date 7849 inspected orders have yielded 212 casual comments by customers indicating a definite opinion relative to some phase of the gas industry. The greater portion of the comments were positive but 69 customers held views that were negative. Service inspectors are emphatically instructed to guard against asking leading questions that would prompt comments of commendation or criticism regarding the service rendered. For the purpose of this study, it is imperative that the comments recorded be a voluntary expression of opinion. The low ratio of comments to total inspected orders is a definite indication that the inspectors are following the recommended neutral approach. Although this project was intended to gather information regarding customer's reaction to service routines, the scope of subjects commented upon by customers is much broader than had been anticipated. People, it seems, are as equally inclined to make general statements regarding the characteristics of gas, the gas company or appliance operation as they are to comment specifically about service routines. The value of this type of activity in improving public relations has long been recognized by industry. Combining it with Quality Control inspections in customers' homes may increase its usability in service organizations.

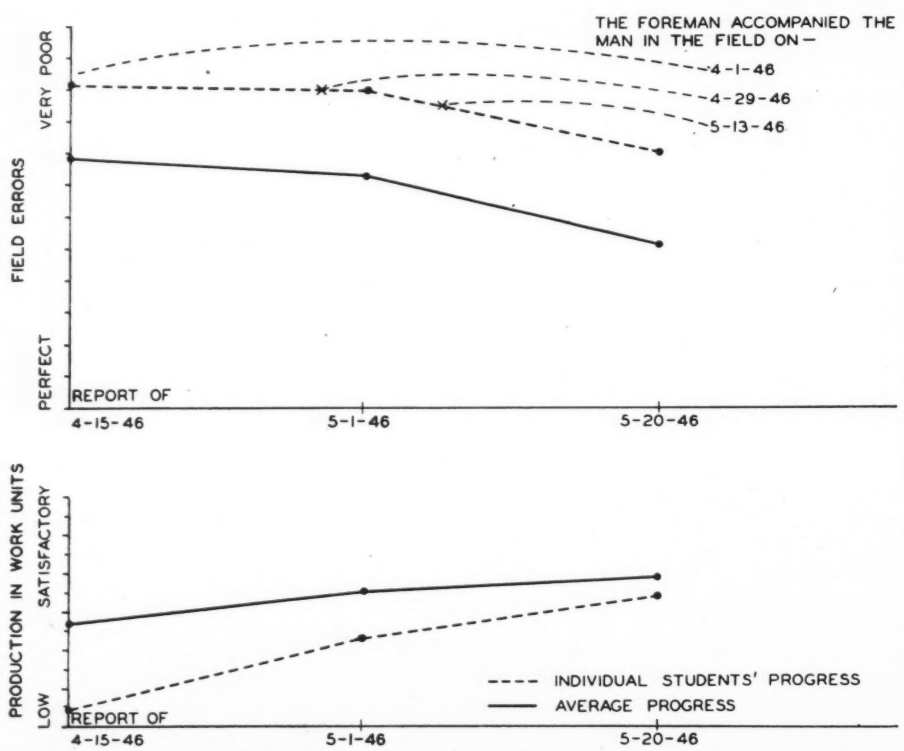

Fig. 10, Progress charts like those shown above are displayed to new employees with unsatisfactory records. It has been discovered by the Southern California Gas Co. that if incompetent servicemen are confronted with a performance record they will voluntarily resign. Not a single case of dismissal based on Quality Control records has been formally protested by former employees.

Conclusion

Although "statistical Quality Control" is a relatively new term, its function is as old as industrial management. It is merely a new way of gathering and compiling information that is necessary for intelligent administration of any business. The need for this type of information is as great in a small organization of 4000 or 5000 meters as in a utility of approximately 1 million meters, such as the Southern California Gas Co. The manager of a small organization is faced with the same problems as the executives of a large company. He must deal with his union, make decisions resulting in the establishment of a policy, provide a means for training new employees and set up some method for determining how closely his field personnel are following instructions. That small company manager is actually engaged in a form of quality control when he investigates customer complaints, studies various operating reports and makes an occasional call in a customer's home.

The whole industrial history has been one of increasing specialization of labor along with greater complexity of the machines, tools and processes of manufacture. Service organizations have in general a more difficult problem than manufacturing plants in obtaining customer satisfaction, without proportionate increase in costs as the complexity of the machines serviced continues to increase.

Gas Refrigeration's New Advertising Portfolio will help you meet the challenge to the Gas Industry

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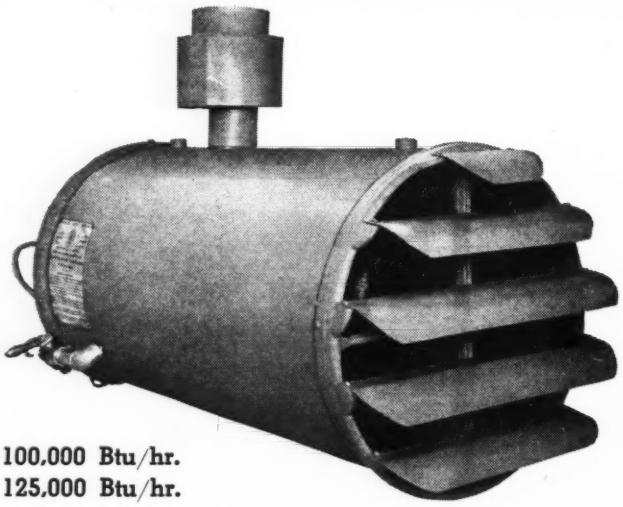

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GAMA Seven-Month Report

Unit shipments of gas-fired appliances, furnaces, and boilers increased during the seven-month period ending July 31, 1947, but limitations governing gas central home heating installations in various sections of the country have held movement of gas conversion burners at a low level, according to a GAMA survey.

Domestic gas ranges and gas-fired water heaters, among items which have showed added activity in reports from 30 manufacturers, were the only units that shipped at a faster pace in July, 1946, than in July, 1947, GAMA reports.

All manufacturers, however, reported huge numbers of unfilled orders. At the end of July, 1947, the backlog on orders for gas ranges was 460,688 units; for water heaters, 447,163; for floor furnaces, 55,003; for gas conversion burners, 20,646; for gas-fired furnaces, 14,472; and for boilers, 6,327.

Gas-fired boilers led other items in boosting unit shipments during the seven-months period with a 143.7% increase. Unit shipments for floor furnaces were 37.1% greater than during the same period in 1946; for gas ranges, 36.5%; for water heaters, 17.9%; and for gas-fired furnaces, 8.1%. Gas conversion burners were shipped at a rate 72.5% less than for the same seven months period in 1946.

The total value of all unit shipments during the 12-month period ending July 31, 1947, was $237,050,000.

WARREN PETROLEUM CORP. has announced the opening of a liquefied petroleum gas sales office at 60 Park Place, Newark, N. J., with C. L. Hulswitt, formerly manager of their Detroit office, in charge. Sales of LP-Gas by Warren in the eastern section of the United States are made possible through tank ship movement of products from the Texas Gulf Coast to a new marine LP-Gas terminal now under construction at Newark. The S. S. Natalie O. Warren, special tank ship, will transport over 1.3 million gals. of propane per trip and will be loaded at Warren's terminal at Norsworthy, Texas (near Houston). It is expected that tank car and truck deliveries from the Newark terminal will be started early in December, 1947.

RHEEM MANUFACTURING CO., 570 Lexington Ave., New York 22, N. Y., has introduced a new publication called "Rheem Dealer News" to be circulated by direct mail to a list of more than 35,000 plumbing, heating equipment and household appliance wholesalers and dealers throughout the U. S. Editorial material includes information on company products, dealer news, promotional aids, merchandising articles, personnel items and technical articles. The magazine is divided into three sections of four pages each—general news, merchandising and technical departments.

CRIBBEN AND SEXTON CO. will support AGA's "Gas Has Got It" campaign with the same theme in all national and trade advertising, as well as sales promotional helps and tie-in material for the dealer. Spearheading the campaign will be advertisements featur-

ing clock-control Universal ranges, built to CP standards, in Good Housekeeping, McCall's, Better Homes and Gardens, House Beautiful, Holland's and Guide for the Bride.

Trade magazine ads will feature "Universal Performance Proves—Gas Has Got It," and will list the nine points on which women base their choice of ranges. Special displays, mats and folders, and an announcement brochure are included among other campaign pieces.

UTILITY APPLIANCE CORP., Los Angeles, has announced expanded advertising plans for that concern and its Gaffers & Sattler and Occidental Stove Co. divisions. Utility Appliance will use trade paper space in heating and ventilating, gas and electric appliance merchandising, gas industry, architectural, building and export publications. Consumer advertisng will include regional magazines and radio and will deal with heating and cooling equipment. Newspapers, radio and outdoor postings will be used for cooperative dealer advertising.

The Gaffers and Sattler division, which manufactures gas ranges, will use consumer advertising in regional magazines and radio. An extensive program of dealer cooperation will be carried out in newspaper advertising and with point-of-sale material. The Occidental Stove division will use dealer cooperative advertising under a program similar to that of Gaffers & Sattler.

PAYNE FURNACE CO., Beverly Hills, Calif., is conducting a national radio campaign in support of its dealers, using 60 stations in 23 states. Beginning last May with California stations, the campaign was extended in June to 19 Pacific coast stations, and in July to 41 more in western states and across the south as far as Orlando, Fla.

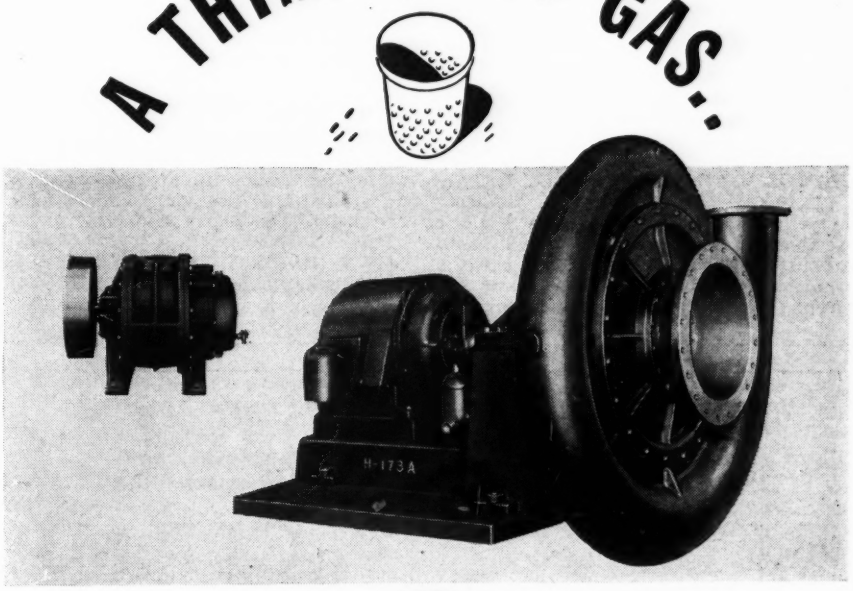
Radio messages for the first three months featured the advantages of ordering furnace installations during the summer when dealers were not so busy. In the fall emphasis was placed on the desirability of proper venting. Radio coverage is now being extended by adding evening station-break announcements or major network stations in key territories.

The Payne advertising and sales promotion campaign for 1947 also includes slide films for sales training; a motion picture; new booklets, folders, catalog inserts and mailing pieces; display units and a comprehensive dealer mat and direct mail service.

SERVEL'S Vice President George S. Jones, Jr., recently told 200 southwestern gas utility firm executives and representatives that the greatest opportunities in the air-conditioning field lie in residential installations. Jones said every new home being built or planned is a prospect for an all-year air conditioner, while many old residences may also be equipped with units. His company is producing sufficient units to meet the increasing demand, Jones stated. W. G. Grube, Servel regional manager with headquarters in Dallas, was host to other Servel officials and visiting utility men at a luncheon.

BENDIX HOME APPLIANCES, INC., will hold a 1948 distributor convention at the Edgewater Beach hotel, Chicago, Jan. 18 and 19. Distributor presidents, general managers and sales managers will attend, as well as other distributor personnel.

A THIMBLE OF GAS..



OR A HOLDER FULL!

From our wide range of sizes and capacities, you can select a Roots-Connersville Booster, Exhauster or Meter to deliver or measure nearly any quantity of gas.

For instance, our Rotary Positive units are widely used where a small volume of gas is to be moved, and for accurate and dependable metering in any quantities. Where the flow is in large volume, you have the choice between Rotary Positive or Centrifugal Gas Pumps, whichever best meets your requirements.

R-C *dual-ability* to supply either Rotary or Centrifugal equipment offers important advantages to users. Because we design and build both types, we can be completely unprejudiced in our recommendations. This *dual-ability* frequently results in substantial savings in first cost and operating and maintenance expense.

Whatever your requirements may be, ask R-C *dual-ability* for the answer. You'll be sure of the right unit to suit your needs, and to give you long years of profitable performance.

ROOTS-CONNERSVILLE BLOWER CORPORATION
711 Oregon Avenue, Connersville, Indiana

ROOTS-CONNERSVILLE
ROTARY CENTRIFUGAL
BLOWER BUILDERS R-C SINCE 1854
BLOWERS · EXHAUSTERS · BOOSTERS · LIQUID AND VACUUM PUMPS · METERS · INERT GAS GENERATORS
★ ★ ONE OF THE DRESSER INDUSTRIES ★ ★

CATALOGS

CLARK BROS. CO., INC., Olean, N. Y. —"Tentative Partial Enthalpies of the Lighter Hydrocarbons," by B. H. Sage, R. H. Olds and W. N. Lacey. Clark offers this reprint in the belief that thermodynamic data of this nature will become a highly desirable working tool. The 14-page pamphlet includes charts and illustrations.

MINNEAPOLIS-HONEYWELL REGULATOR CO., 2753 Fourth Ave. S., Minneapolis 8, Minn.—A new electric clock thermostat, the Chronotherm, will help gas utilities solve the following three problems, according to the manufacturer: (1) the threatening fuel shortage, (2) mid-winter morning peak loads, (3) providing an item for salesmen to sell. The firm offers a four-page catalog, as well as a number of free sales aids designed to tie in with the company's national advertising program.

FISCHER & PORTER CO., Department 4E-F, Hatboro, Pa.—"A New Era in Liquid & Gas Flow Measurement." This 32-page bulletin is profusely illustrated and contains informative material describing advantages of the Flowrator meter for flow rate measurement. Requests for this literature should be addressed to the above department.

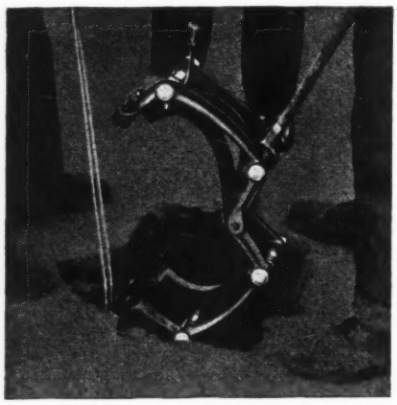
MINE SAFETY APPLIANCES CO., Braddock, Thomas and Meade Sts., Pittsburgh 8, Pa.—Bulletin No. CU-1 describes the new portable welding fume exhauster, designed for use in welding operations where stationary ventilating systems are unavailable or impractical. It is especially suited for operations in cramped, confined quarters or where the welder must move from place to place in enclosed areas.

DAVIS EMERGENCY EQUIPMENT CO., INC., 116 Halleck St., Newark, N. J.—Technical Bulletin No. 1139 describes the Model 5 Vapotester, designed for the detection of combustible gases or vapors. Featured in the bulletin is the method of locating leaks in underground gas mains and service lines. Also outlined is the procedure for checking the progress of intensity of leaks when there are more leaks to repair than there are crews. The Vapotester can also be used for checking the gas-free condition of tanks or enclosed vessels or areas which have contained a combustible gas.

NORMAC
BELL JOINT CLAMP

Solves Your Joint Repair Problems

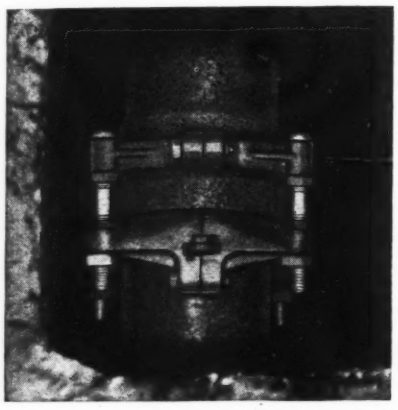
6 inch NORMAC clamp being lowered into hole for installation



QUICK - EASY - PERMANENT

Installed in pavement openings 1' x 1'. Available in all standard sizes from 3" to 12". A simple set of tools cleans the joint, installs the clamp . . . often in only a quarter of an hour. SAVES TIME. SAVES MONEY and the repair is permanent. Designed for all conditions particularly where pavement repair costs are prohibitive.

6 inch NORMAC clamp in service after installation



Normac Clamps can be installed in large openings as well as small openings.

Write for literature illustrating this simple solution to one of the Gas Industries most trying problems and ask for our catalog describing our complete line of . . .

COUPLINGS . . . FITTINGS
SERVICE TEES and ELLS
SLEEVES . . . COMPRESSION-END COCKS . . . COMPRESSION-END METER BARS

NORTON-McMURRAY MFG. CO.
39 SOUTH LA SALLE ST. • CHICAGO 3, ILL.
Method and product covered by U.S. Patents, Nos. 2,163,261 and 2,178,286.

CURRENT READING

Inspecting Incoming Material — North American Philips Co., Inc., 100 East 42nd St., New York, N. Y. This folder on quality control suggests procedures that may be followed from the time material arrives in a plant until it is finally accepted or rejected. Requirements covering a typical inspector training course are presented, and a number of standard forms needed in this phase of quality control work are illustrated. The company will send free copies upon request.

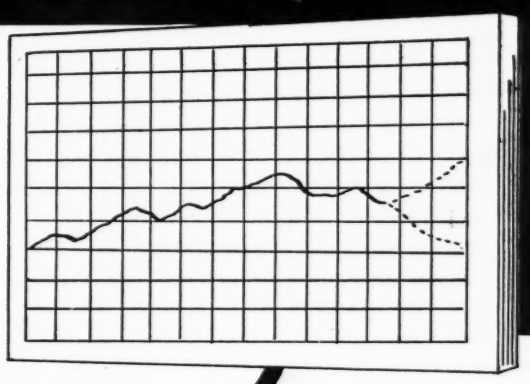
Business Organization — Policyholders Service Bureau, Metropolitan Life Insurance Co., 1 Madison Ave., New York 10, N. Y. This report presents the results of a study of the organization plans of 27 representative companies. Although it recognizes the fact that organization is an individual problem which must fit the specific needs of an individual company, it shows how these principles and patterns are made to fit the needs of manufacturers, merchandising concerns, railroads and public utilities.

How to Sell to the Government—Journal of Commerce, 63 Park Row, New York 15, N. Y. Copies of this 32-page booklet designed to take the mystery out of bidding and contract procedures may be obtained from the above address at 50 cents each. It is prepared as a guide to manufacturers, jobbers and dealers and explains the nature of the various government markets and tells how to get on mailing lists for materials and products wanted.

Stop Fires—Save Jobs—National Board of Fire Underwriters, 85 John St., New York 7, N. Y. This 16-page booklet is designed to help management and labor cooperate in a sound program of fire prevention. It points out that industrial fires also cause losses in employment, lost production and business failures two or three times greater than the dollar property loss.

Research in Controlled Vacuum Heat Treating—Jack Huebler, Research Laboratory, Surface Combustion Corp., Toledo, Ohio. This 19-page book is the final report on Project No. IGR-49 sponsored by the Committee on Industrial and Commercial Gas Research of the American Gas Association. It is available from AGA headquarters, 420 Lexington Ave., New York 17, N. Y.

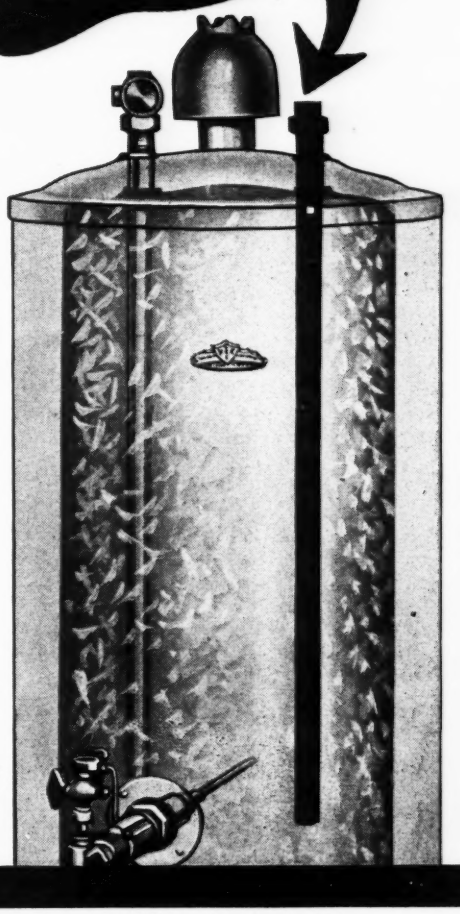
HOW IS YOUR SALES BAROMETER?



Keep it going up

with **REX Automatic WATER HEATERS**

"Elco"



Sales-Making Rex Features

- **RUST-FREE HOT WATER.** Rex Automatic Water Heaters are "ELNO" equipped to prevent corrosion of the storage tank and to assure the user of Rust-Free Hot Water at all times.
- **FAST RECOVERY.** An ample supply of hot water is available even in homes using an Automatic Laundry.
- **THREE STYLES.** (1) Rex Model "G"—round type. (2) Rex NuMode—modernistic square design. (3) Rex Table-High—square type for the modern kitchen.
- **SELLING HELPS.** Sales promotion campaigns to fit your individual needs.
- **SALES TRAINING AIDS.** Three-volume "Service of Selling" texts for use by your own as well as your dealers' sales force.

THE CLEVELAND HEATER CO.

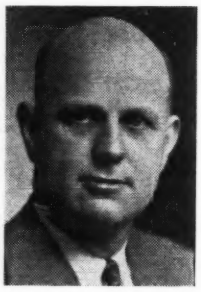
2310 Superior Ave. Cleveland 14, Ohio

PATENT APPLIED FOR

PEOPLE

W. S. Rowley
. . . Kaiser Fleetwings

Max Willemin



W. E. Dunn
. . . Fluor

C. Brockschmidt
. . . TETC

PAUL L. YAGER, general sales manager of Kaiser Fleetwings Sales Corp., Oakland, Calif., has announced three personnel changes in the sales force. WENDELL S. ROWLEY, formerly manager of national accounts at Chicago, has been promoted to assistant sales manager in charge of distributor-dealer relations, with headquarters at Oakland. MAX H. WILLEMIN, formerly a regional manager headquartered in San Francisco, has been made assistant sales manager in charge of contract sales and has moved to the Oakland office. ALFRED D. HOWARD, assistant general sales manager, who has been located at the Fleetwings factory in Bristol, Pa., has been transferred to Oakland and will assist Yager with staff work.

SHIRLEY E. MESERVE, vice president and general counsel, was elected president of Fluor Corp., Ltd., Los Angeles, at a special meeting of the board of directors on Sept. 18. Meserve has supervised Fluor's legal affairs since 1926 and is a member of a Los Angeles law firm. W. EARL DUNN, vice president and general manager, will now serve as executive vice president: D. W. DARNELL, vice president and chief engineer, was promoted to vice president and general manager; and J. ROBERT FLUOR, manager of manufacturing, was named vice president and assistant general manager. JAMES P. WISEMAN, director of sales, and T. H. SEAVEY, manager of purchases, both were made vice presidents. ROBERT L. MERRICK, assistant chief engineer, was elevated to chief engineer, and FOSTER M. STEPHENS, director of development, was advanced to assistant manager of manufacturing.

C. L. BROCKSCHMIDT recently became manager of gas sales for Texas Eastern Transmission Corp. with headquarters at Shreveport, La. For the past 2½ years he has been on the staff of the Standard Oil Co. of New Jersey traveling in Latin American, Europe and North Africa as marketing specialist. During the war he served as chief of allocation and supply section, Natural Gas Division, Office of War Utilities, Washington, D. C. Prior to the war, Brockschmidt was associated with Mississippi River Fuel Corp. as combustion engineer from 1931 to 1942 and as industrial gas sales engineer for Lone Star Gas Co. from 1927 to 1931.

K. M. CLARK, former secretary and treasurer of Ruud Manufacturing Co., Pittsburgh, Pa., was elected vice president and treasurer of the firm at the annual election of officers. W. M. LATTA was elected secretary. Other officers re-elected were M. G. HULME, chairman of the board; R. H. LEWIS, president; J. H. SORG, vice president and general counsel; M. M. SCOTT, vice president; and J. K. ROTH, assistant secretary and treasurer.

PERRY M. GISH, assistant general traffic manager of American Radiator & Standard Sanitary Corp., has been promoted to general traffic manager. He succeeds BENJAMIN S. THOMAS, who retired recently. Gish has been with American-Standard for 28 years.

H. A. GEHRES and RALPH L. BOYER have been promoted by The Cooper-Bessemer Corp., Mount Vernon, Ohio, in recognition of their contributions to improvement of products in recent years. The board of directors named Gehres executive vice president, and Boyer's new title is vice president and chief engineer. Both men are recognized as leaders in the diesel, gas engine and compressor fields. Gehres joined the company in 1910 and Boyer began his service in 1926.

H. A. Gehres

R. L. Boyer

JOHN C. FLANAGAN has been promoted to general manager of the Texas operating division of the United Gas Corp., it has been announced by N. C. McGOWEN, president. At the same time the retirement of J. V. STRANGE of Houston, who for the past 17 years has been vice president and general manager of the operating division, was revealed. Under Strange's direction United's operations were greatly expanded since 1930, when he took over.

THIS COUPON MEANS business!

FRASER Dept. F-E11, 11 West 42nd St. New York 18, N.Y.

Tell me how I can get a FRASER Franchise

NAME _____

FIRM _____

ADDRESS _____ STATE _____

CITY _____

profitable BUSINESS FOR YOU

It means an opportunity to sell famous Fraser Appliances in an exclusive, protected territory!

It means profits because Fraser has been making quality heating appliances for over 25 years. You can really sell behind that kind of reputation!

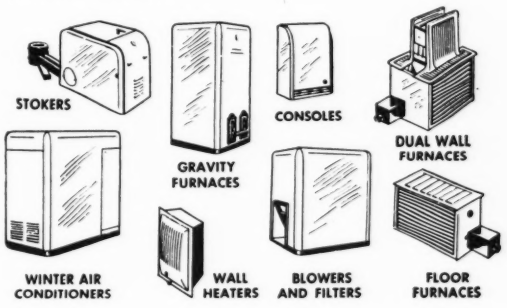
Extra profits, too. With a Fraser franchise you sell a complete line of products. You order everything through one source, get assorted merchandise to meet your needs —and you get a profitable discount for carload quantities. Also, a profitable 2% advertising allowance on all earned invoices.

Your dealers will find Fraser profitable. They'll have full packages of sales promotion aids—and the Dealer Floor-Finance Plan enables them to carry a full line of stock with only a 10% cash down payment.

That's why we say the Fraser franchise means profitable business. Investigate this great opportunity. Mail the coupon today!

All gas appliances are approved by the American Gas Association

All electric appliances are approved by Underwriters' Laboratories, Inc.



GET YOURSELF A Fraser FRANCHISE

IRVING A. DENISON has been appointed chief of the Underground Corrosion Section of the National Bureau of Standards, according to an announcement by DR. EDWARD U. CONDON, director. Denison will direct fundamental studies of underground corrosion utilizing the data from extended field tests, involving the burying and periodic excavation of thousands of specimens of pipe materials and protective coatings in representative soils.

A. P. SMITH, national service manager for Bendix Home Appliances, Inc., South Bend, Ind., has announced the appointment of three service supervisors. They are: ELDON T. JONES, Kansas City, Mo., territory; R. C. PERKEY, unassigned; and LOY D. JONES, home office.

W. B. Eckenhoff

W. B. ECKENHOFF has been appointed sales manager for Roberts & Mander Corp., Hatboro, Pa., succeeding John H. Emery, who died on Aug. 24. Eckenhoff will exercise general supervision and direction of the firm's sales and marketing program. He has been active in the Roberts & Mander sales organization for over 13 years and was assistant sales manager for eight years before his present appointment.

STEPHEN B. SEVERSON, president of the Republic Light, Heat & Power and Dominion Natural Gas Co.'s, Buffalo, N. Y., has announced the promotion of seven executives to fill vacancies resulting from the recent death of James A. Richie, who was vice president, secretary, treasurer and a director of the companies. JOHN R. REEVES, general superintendent, was elected vice president and DONALD A. HAMILTON, assistant treasurer, was elected treasurer. DONALD P. SPENCER, assistant secretary, became secretary and HUBERT P. NAGEL moved into the post of assistant secretary of the Republic company. ROBERT M. ROBINSON was elected assistant secretary of the Dominion company. New assistant treasurers are HOWARD F. MOORE and WALTER G. STROMAN.

EDWIN A. MURRAY and HOWARD M. BOTELER have been appointed as assistant managers of the compressor division at Buffalo, N. Y., of Worthington Pump & Machinery Corp., Harrison, N. J. Murray is in charge of industrial and government compressor business, and Boteler is in charge of oil refinery and chemical compressor business.

F. WILLIAM KAHRL has been appointed controller of The Cooper-Bessemer Corp., Mount Vernon, Ohio. The position formerly was held by JAMES E. BROWN, who was named treasurer to succeed ZENNO E. TAYLOR upon his retirement nearly a year ago. Since that time, Brown has held both offices.

JOHN W. KIGHT has been named plant manager of the Lawson Manufacturing Co., Pittsburgh, Pa., makers of water and home heating appliances. Kight recently was vice president of the Rotogravure Engineering Co., Everett, Mass.

- OBITUARIES -

Burt Barnes

BURT D. BARNES, associated with Western Stove Co. since 1933, and for the past seven years sales manager of that firm, was stricken with a heart attack at his desk on Oct. 1. He was 60 years old and had seemingly been in excellent health up to the time of his death. He had attended the Pacific Coast Gas Association convention at Coronado late in September.

FLOYD F. McCAMMON, 57, vice president and general superintendent of electrical operations, Public Service Co. of Colorado, passed away in Denver on Sept. 20. McCammon began his public utility industry career in 1916 when he became associated with the Denver Gas and Electric Light Co. as a junior engineer. He progressed steadily until his election as vice president of the Public Service Co. of Colorado in 1943.

HENRY S. NORRIS, 80, retired secretary-treasurer of the Iroquois Gas Corp., died in his Buffalo home recently. He began his career with the Buffalo Natural Fuel Gas Co., predecessor of Iroquois. He was made secretary-treasurer of Iroquois in 1914.

ARCCO
The World Over
—wherever there is gas
ARCCO-ANUBIS
GAS
GRAVITOMETERS
• Once calibrated and properly installed the Arcco-Anubis Gas Gravitometer requires no further attention. Hundreds are in use in pipelines and refineries of major companies. • This precision specific gravity instrument is constructed without electric motors, pressure regulating valves or other complex arrangements. The instrument is practically frictionless and the gas flows through it continuously, thus minute changes in specific gravity are recorded at once as they occur. As shown through years of use, Arcco-Anubis Gas Gravitometers remain accurate and highly responsive even under severe conditions of service.
Send for Bulletin No. 101
AMERICAN
RECORDING CHART CO.
E. 11th St. • Los Angeles 23, Calif.
Available for Early Delivery
SEND FOR BULLETIN No. 101

NEW PRODUCTS

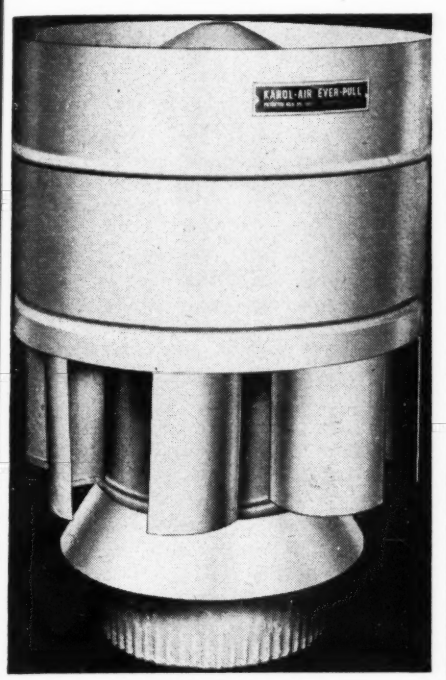
Vent Cap

HAMMEL RADIATOR ENGINEERING CO., 3348 Motor Ave., Los Angeles 34, Calif.

MODEL: Karol Air Ever Pull.

APPLICATION: This patented vent cap makes it possible to set the cap nearly flush with the roof and still maintain an even pull regardless of unusual draft conditions or high velocity winds.

DESCRIPTION: This new sheet metal



cap has been rigidly tested by the Board of Building and Safety, City of Los Angeles, and was approved and adopted by the building code. The long pipe and A-frame may be replaced by this product, resulting in a more attractive roof line and better performing fuel burners.

Slide Rule

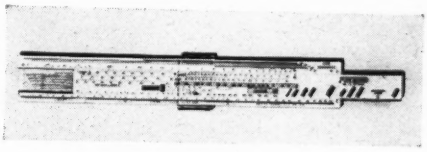
THE FOXBORO CO., Book Department, Foxboro, Mass.

MODEL: Flow-Rule.

APPLICATION: This specially designed 12-in. slide rule is for computing orifice plate bores, flow nozzles or venturi throats, and also the rate of flow, or the differential created across the orifice plate (whether flange tapped or full flow tapped) or other primary device. May be used for all fluids, with or without seals, and covers a wide range of flows and line sizes.

DESCRIPTION: Cost of the rule may be saved many times where the correct determination of line size or flow rate is important. Use of the Flow-Rule will be quickly understood by anyone familiar with a slide rule. Instructions are on the back, and the reversible slide has scales for gas on one side and liquids and steam on the other. The use of color to distinguish the scales for such fluids adds to convenience. Other color bands are shown, with tick marks indicating the I. D. of schedule 30, 40, 80 and 120 pipe.

The instrument is expertly constructed on moisture-proof plastic, free from effects of warpage or thermal contrac-



tion or expansion. Solid construction eliminates need or adjustment for clearance or alignment. Slide works easily without excessive friction. Sales line up without parallax and are on white vinylite with a clear plastic covering which protects scale markings. The rule comes in a case of heavy leather, equipped with a plastic window for the owner's card. Price is $25.

Swing Check Valves

POKORNEY MANUFACTURING CO., 3117 Clybourn Ave., Chicago, Ill.

MODEL: 3000 Series Swing Check Valves.

APPLICATION: These valves, states the manufacturer, offer the advantages of sensitivity to low flow, full flow through the valve with minimum resistance, non-leaking through the check, and a free action check mechanism

WARREN ANNOUNCES ATLANTIC SEABOARD FACILITIES AT NEWARK

Warren's LP-Gas marine terminal at Newark, N. J., now under construction, will receive its first cargo of propane via SS "Natalie O. Warren" early in December, 1947.

This new tank ship and terminal brings to the Eastern Seaboard large additional supplies of LP-Gas, so badly needed for industrial, utility, and household uses.

Sales offices at 60 Park Place, Newark, N. J. Telephone Humbolt 5-1489.

"1922 - Silver Anniversary Year - 1947"

WARREN PETROLEUM CORPORATION
TULSA, OKLAHOMA
Detroit Mobile Houston

captan
The answer to your gas ODORIZING PROBLEMS
GAS LIKE SMELL
HIGH ODORIZING VALUE
NON-FADING
UNIFORMITY
AVAILABILITY
HARMLESS
USE captan BE SURE
NATURAL GAS ODORIZING CO., INC.
7620 WALLISVILLE ROAD
HOUSTON 10, TEXAS

which will not stick on minimum flow.

DESCRIPTION: Available in both the screwed and flanged types, in bronze aluminum and grey iron, in I.P.S. sizes of ½ to 6 in. Larger sizes will be available later. Carefully engineered, and manufactured by precision machinists, the valves are especially adapted for use with manufactured, natural or LP-Gas. Bulletin No. 3001 describing this new series is available upon request to the manufacturer.

Strip Chart Recorder

WHEELCO INSTRUMENTS CO., Chicago, Ill.

MODEL: Capacilog.

APPLICATION: Designed for the measurement indication control and permanent record of variables in the process industries.

DESCRIPTION: The instrument operates on a Wheelco electronic principle which has been successfully applied to the company's Capacitrol pyrometer controller for many years. In this new Capacilog the firm adds the recording function with a positive power driven pen to the electronic link between meas-

urement and control for deflection and null method types of measuring systems. Simplicity of operation without amplification, physical contact or disturbance in the measuring circuit (no relays or converters) results in accurate and instantaneous response. Simplicity of design with a minimum of moving parts and front-accessibility throughout results in ease of service and maintenance.

The Capacilog is available as a deflection, potentiometer or resistance thermometer type recorder, recording controller or indicating controller.

L-P GAS
DESIGN
EQUIPMENT
ENGINEERING
FUEL SUPPLY
AND
CONSULTING SERVICE
UNITED PETROLEUM GAS COMPANY
806 ANDRUS BUILDING, MINNEAPOLIS 2, MINN.
616 FIELD BUILDING, CHICAGO 3, ILLINOIS
Jackson, Miss. Oxford, Pa. 1652 Hickory St., Bartlesville, Oklahoma

Peerless
★ Circulators
★ Gas Heaters
EXTRA-Quality...Value
63 years of Peerless research in the Science of Heating and its allied problems of Engineering, Design, Styling and Finish has resulted in today's outstanding quality heating equipment.
The Peerless line is
★ Made to Sell
★ Made to Satisfy
★ Made to Last
Peerless
MANUFACTURING CORPORATION
INCORPORATED
LOUISVILLE, KENTUCKY

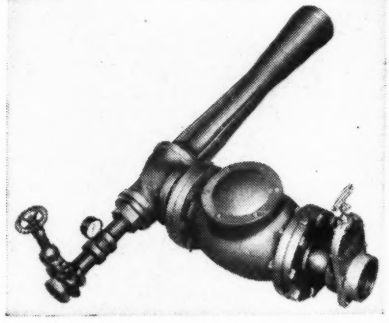
Venturi Injector

ECLIPSE FUEL ENGINEERING CO., 730 So. Main St., Rockford, Ill.

MODEL: Special Venturi Injector Assembly.

APPLICATION: For better utilization of protane and butane gases and mixtures in gas plants.

DESCRIPTION: Considerable saving is promised through the use of these in-



jectors, as they are operated without the use of compressors, pumps or mechanical equipment which entail extra expense for equipment, maintenance and labor. They are claimed to be especially advantageous when applied to gas plant installations requiring the mixing of two gases, or a gas with air, where the primary gas is already available under utilizable pressure. The pressure must be sufficient to entrain the secondary gas or air, as the case may be. Uniformly controlled mixing is obtained as the

injectors can be throttled over a wide range of inlet pressures. They will then automatically maintain a very close ratio of flow between the pressure gas and the entrained or diluting gas.

This equipment enables gas plants using LP-Gas to provide facilities for standby service, auxiliary or peak load shaving, or retirement of old carburetted water-gas sets. In addition to mixing applications, the assemblies are being used for pressure boosting, for operation of wet-dry bulb instruments in saturation or hydration plants, for circulation of gases, and for other special requirements.

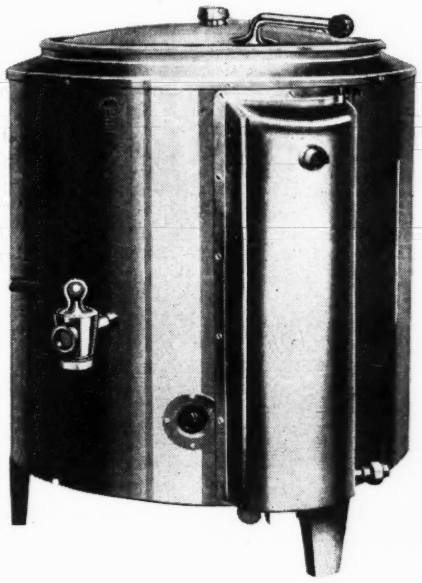
Steam Cooking Kettle

GROEN MANUFACTURING CO., 4537 W. Armitage Ave., Chicago 39, Ill.

MODEL: A-H.

APPLICATION: For fast, efficient domestic cooking.

DESCRIPTION: This self-contained, gas heated steam cooking kettle is said



to be versatile, safe and fully automatic. The absence of safety valves, pressure gauges, water gauges, and liquid level controls provides convenience of operation and freedom from excessive maintenance. The steam generating chamber is hermetically sealed and has automatic thermostatic control. The kettle is stainless steel inside and out, with controls enclosed in a ventilated streamlined housing mounted on the outer shell. Temperatures may be held accurately at any point from 140°F. to 250°F.

Rubber Hose

UNITED STATES RUBBER CO., Rockefeller Center, New York, N. Y.

MODEL: Special Synthetic Rubber Hose.

APPLICATION: For handling propane and butane gas, particularly in transferring LP-Gas to homes, factories and other points from supply truck to storage tank.

DESCRIPTION: Increased strength and lighter weight are achieved through a special synthetic rubber compound capable of resisting the effects of LP-Gas. The hose is reinforced with Ustex yarn, a chemically-treated cotton textile having high strength and low stretch characteristics.

Continuous lengths in three sizes will be available — ½-in., ¾-in. and 1-in. ID. It will be branded every 5 ft. with the name U. S. Giant LP-G hose.

Non-Lubricated Valve

JOHNSON FOUNDRY AND MACHINE CO., 1119 N. Main St., Los Angeles 12, Calif.

MODEL: LJS Plug Valve.

APPLICATION: Flange and screw type available in ferrous, non-ferrous and special metals for every type of industrial use. Now in service in oil fields, refineries, pipe lines and processing industries.

DESCRIPTION: This quick-opening high pressure fluid control valve features a straight, non-tapered plug that requires no lubrication and is suspended top and bottom on sealed ball bearings which take the thrust radially. This plug is the only moving part. A quarter turn opens and closes valve at high pressures and temperatures, requiring very little torque.

Floating seats of hardened steel are ground and lapped for a precision fit with plug for perfect seal at each port. Plug does not touch body at any point, keeping friction to a minimum. Behind

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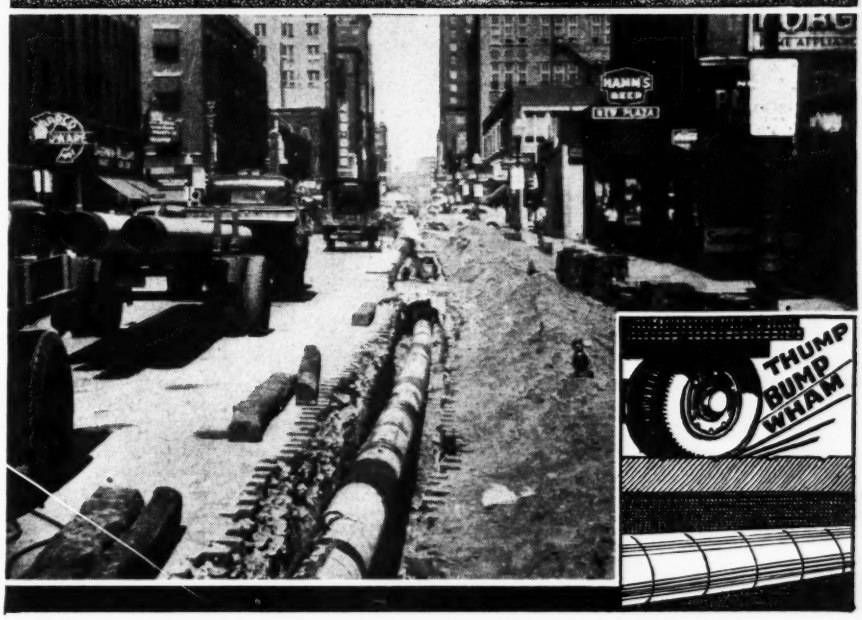

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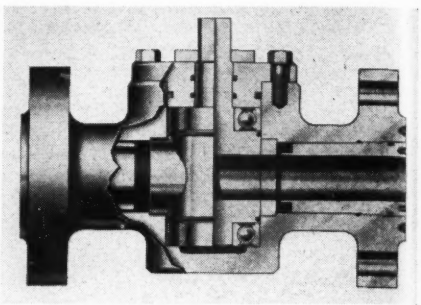
each seat, an expansion gland forces seat tightly against plug with just enough "give" to prevent plug from seizing or sticking. These glands are



held in place by replaceable steel retainer sleeves. At no time does fluid come in contact with valve body; wear can only result from longitudinal flow of fluids. All wearable parts (plug, seats, glands, sleeves) may be replaced on the job without use of special tools.

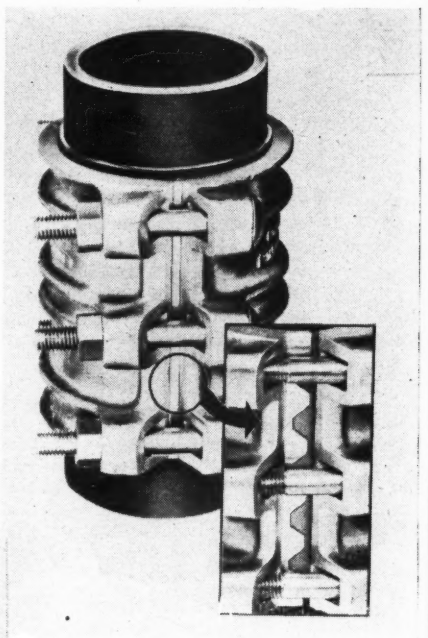
Repair Clamp

SMITH-BLAIR CO., San Francisco.

MODEL: Repair Clamp.

APPLICATION: For repairing broken or split cast iron or cement-asbestos pipe.

DESCRIPTION: Installation of this new cast bronze full circle repair clamp requires the simple bolting together of the two halves of the coupling over the



broken or split cast iron or cement-asbestos pipe. The use of bronze for the coupling and duronze nuts and bolts is contemplated to assure permanence of repair. The new Smith-Blair clamp forms a complete water-tight circle that compensates expansion and contraction of the pipe. Special molded rubber gaskets with copper armor are bonded to the inside of the coupling sleeves so that the fingers may slide easily over the gaskets until they overlap to form a full wrap-around. The rubber gasket as a result, cannot wrinkle or gather under the coupling.

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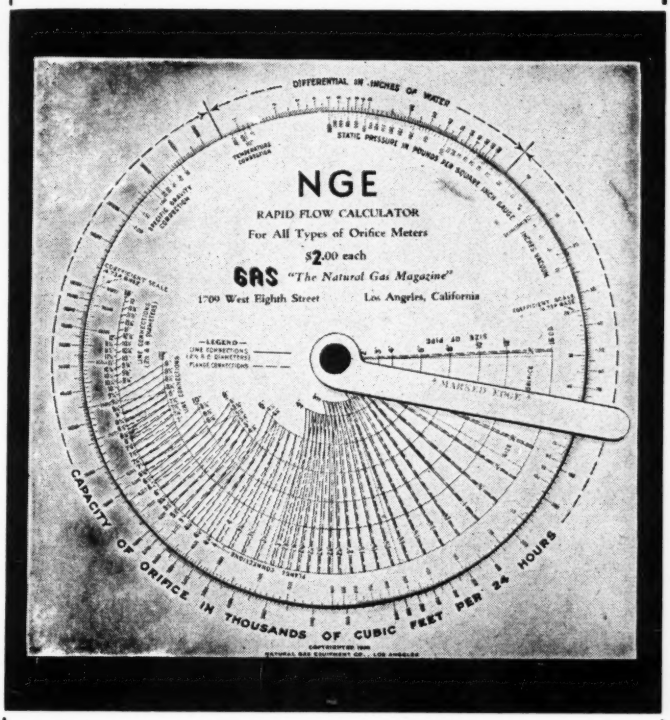
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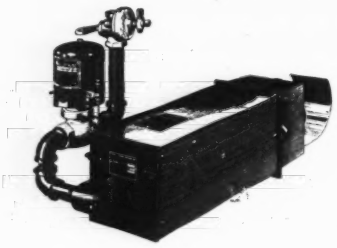
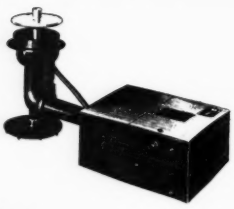


SERIES 400



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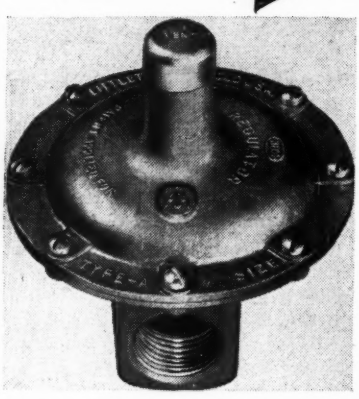

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Fire Extinguisher

ANSUL CHEMICAL CO., Fire Extinguisher Division, Marinette, Wis.

MODEL: Ansul 4.

APPLICATION: For extinguishing fires in flammable liquids, gases, solids and electrical equipment and also for controlling fires in ordinary combustibles.

DESCRIPTION: The extinguisher, 19⅛ in. long, 3½ in. in diameter and light in weight, is designed for effective use by inexperienced operators, according to the manufacturer. The agent used, Ansul Plus-Fifty dry chemical, is claimed to be non-toxic, non-corrosive, non-abrasive and a non-conductor of electricity.

Maintenance is said to be greatly simplified and the extinguisher can be quickly recharged on the spot after use. It is supplied with a quick-opening bracket for vertical or horizontal mounting in locations where space is limited, such as in industrial plants; on trucks, buses, autos; or in homes, stores, institutions, boats, etc., where fire hazards do not demand larger equipment.

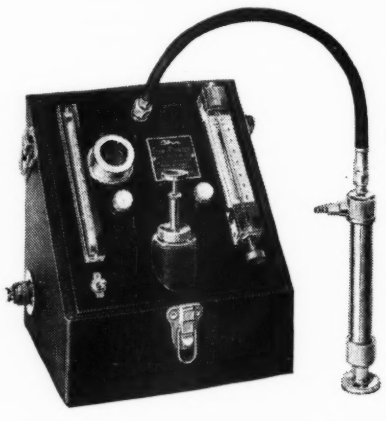
Dewpointer

ILLINOIS TESTING LABORATORIES, INC., 420 N. LaSalle St., Chicago 10, Ill.

MODEL: Alnor Dewpointer.

APPLICATION: For measuring humidity with ease and accuracy.

DESCRIPTION: The precision-built Dewpointer eliminates the need for external coolants. The dew or fog is observed suspended in air, not on a polished surface. Thus, it is easier for two or more observers to get the same results. Readings are said to be accurate and are taken in a matter of seconds after only a short period of practice.



Simple and compact, the Dewpointer is built to precise instrument standards. Available in two ranges—for dew point between —20°F. and room temperature and from —100°F. to 0°F.